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# AGRICULTURAL ECONOMICS AND SOCIOLOGY



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## OF

# AGRICULTURAL ECONOMICS AND SOCIOLOGY

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No. 1

### MARKETING OF AGRICULTURAL PRODUCE

#### The Agricultural Crisis in 1930-31.

*In the publication The Agricultural Situation in 1930-31, which serves as Economic Commentary on the International Yearbook of Agricultural Statistics for the same year, the International Institute of Agriculture presents a survey of the situation of agriculture throughout the world over that period. For the benefit of the readers of the International Review of Agriculture an extract is here published from the part of this Commentary which deals with the situation in general, containing a brief survey of the main features in the recent phase of the world crisis in agriculture, the factors by which the course of this crisis is being determined, and the tendencies that appear to stand out from the examination of the facts and figures. For the details of the development which has taken place in 1930-31 in the conditions of the world market of agricultural products, as well as in the agriculture of the separate countries, our readers are referred to the Economic Commentary, which is shortly to be published.*

In the course of the agricultural year 1930-31, there has been considerable aggravation of that critical phase of the post-war depression on which world agriculture entered in 1929.

Prices of agricultural products which had already considerably declined, on the world market continued to fall. The index-numbers of the prices of agricultural products in certain countries, which we give below, though they can only give an imperfect idea of this movement, at least indicate its intensity.

#### General Price Indices of Agricultural Products

(Base: first quarter of 1929 = 100).

Quarters	England	Estonia	Finland	Germany	Hungary	Italy
1929 1st . . . . .	100	100	100	100	100	100
" 3rd . . . . .	102.8	93.3	90.7	99.5	79.9	90.2
1930 1st . . . . .	100.0	80.0	82.2	87.1	68.7	82.3
" 2nd . . . . .	98.1	71.1	77.6	83.2	61.9	77.3
" 3rd . . . . .	95.1	69.3	76.6	86.4	61.9	75.4
" 4th . . . . .	88.9	64.9	69.2	88.1	59.7	69.5
1931 1st . . . . .	87.5	64.0	69.2	79.9	60.4	68.7
" 2nd . . . . .	85.4	64.0	...	81.4	62.4	65.1

Quarters	Netherlands	Poland	Argentina	Canada	New Zealand	United States	
						B. A. E.	B. I. St.
1929 1st . . . . .	100	100	100	100	100	100	100
" 3rd . . . . .	101.4	92.0	101.9	100.1	95.4	103.7	100.9
1930 1st . . . . .	89.3	78.4	89.5	99.7	80.5	95.6	92.3
" 2nd . . . . .	84.6	76.3	88.2	92.6	77.4	91.0	87.3
" 3rd . . . . .	86.4	75.0	83.1	73.3	75.3	80.9	79.5
" 4th . . . . .	78.9	70.9	66.4	63.6	64.1	75.0	74.5
1931 1st . . . . .	77.1	64.0	60.1	61.9	57.4	67.6	67.3
" 2nd . . . . .	78.2	71.4	59.6	60.2	56.7	63.7	63.9

As in 1929-30, the depression in agriculture was closely linked with the general economic crisis, not only by the fact that certain factors in the crisis were common to all forms of economic activity, but also on account of the influence which the agricultural situation and industrial, commercial and financial conditions exercise on one another. In fact, the fall in the prices of agricultural products, though it was perhaps generally more pronounced than the fall in the prices of industrial products, was only one of the manifestations of a general tendency which could be seen in all branches of production.

The more or less universal character of this movement may be illustrated by the wholesale price indices in some of the more important countries constituting the world-market.

*General Indices of Wholesale Prices.*

(1913 = 100).

	France	Germany	Italy (Bachi)	United Kingdom (Board of Trade)	Australia	Canada	United States (B. I. S.)
1913 . . . . .	100	100	100	100	100	100	100
1920 . . . . .	502.8	...	...	307.3	227.9	243.6	221.2
1925 . . . . .	546.5	141.8	592	159.1	169.5	160.3	143.3
1926 . . . . .	697.2	134.4	604	148.1	168.4	156.3	143.3
1927 . . . . .	617.8	137.6	501	141.6	167.0	152.7	136.7
1928 . . . . .	619.3	140.0	462	140.3	164.7	150.6	140.0
1929 . . . . .	611.4	137.2	447	136.5	165.7	149.4	138.3
1930 . . . . .	535.5	124.6	386	119.5	146.7	135.3	123.6
1930 July . . . . .	537.7	125.1	375	119.2	151.1	134.1	120.3
" August . . . . .	531.9	124.7	379	117.7	148.9	131.4	120.3
" September . . . . .	524.2	122.8	375	115.5	140.8	128.9	120.6
" October . . . . .	508.2	120.2	364	113.0	135.9	127.2	118.3
" November . . . . .	493.5	120.1	361	112.0	132.1	124.7	115.2
" December . . . . .	487.6	117.8	350	108.0	123.6	121.6	112.3
1931 January . . . . .	483.7	115.2	342	106.9	130.4	119.8	110.3
" February . . . . .	481.7	114.0	338	106.2	123.4	118.8	108.2
" March . . . . .	481.7	113.9	339	105.9	129.1	117.3	106.7
" April . . . . .	483.7	113.7	337	105.7	123.1	116.4	105.0
" May . . . . .	470.1	113.3	332	104.4	...	114.1	102.1
" June . . . . .	468.1	112.3	327	103.2	...	112.8	100.3

An examination of the above table shows that, in general, during the years 1925 to 1928, the period preceding the present depression, the movements of prices in the different countries were not uniform, being determined to a large extent by national factors peculiar to each country.

On the other hand, the characteristic of the movement of prices since the

beginning, in 1929, of the present depression, is that the fall is general and seems to affect all countries alike. In fact, since the crash which occurred in the United States money market in the autumn of 1929, there is not a single country which has not felt the effects of the economic crisis which has become, in the fullest sense, a world crisis.

In the Economic Commentary for 1929-30, we tried to indicate the origin and nature of the agricultural depression as an essential factor in the general economic crisis. The examination of the agricultural situation in 1930-31 does not seem to us to reveal any radical changes in the nature of the agricultural crisis. The conditions of world agriculture in 1930-31 differ from those of the previous year only in the spontaneous development of factors already present in the situation of 1929-30 or in the extension and intensification of the activities the earlier phases of which have already been noted. However, the relations between the agricultural depression and the general economic crisis seem to have become closer as the conditions of agriculture became more serious and reacted more strongly on industrial, commercial and financial conditions.

As in 1929-30, the common factors forming the principal link between the agricultural depression and the world economic crisis are monetary conditions and trade policy. The development of these two important factors and their influence on one another during the agricultural year 1930-31 are of particular interest.

Perhaps the most characteristic movement affecting monetary conditions in 1930-31 was the tendency that manifested itself to the concentration of gold in the hands of certain creditor countries, notably the United States and France. In the monetary history of the post-war period this tendency has already played an important part, especially up to the moment of monetary stabilisation in Europe, after which there was a slight redistribution of gold in favour of certain debtor countries of Europe. Thus, from 1925 to 1928, considerable quantities of gold were imported into Germany, and generally during this period there were some changes in the movements of gold which tended to a more equitable distribution of reserves. In 1929, at the beginning of the present depression, the situation in this respect was uncertain and disturbed, strong movements taking place in directions contrary to the tendencies noted in the previous period. The final result was that in 1929 certain countries found their reserves seriously reduced in favour of certain other countries which had become regular importers of gold. Some countries that export agricultural products, such as Argentina, Brazil and Australia, suffered very considerable losses of gold during the agricultural year 1929-30. During 1930-31 a general tendency to the concentration of gold manifested itself in an unmistakable manner and the unequal distribution of the standard metal being thus aggravated no doubt exercised an influence on the conditions of credit, of the monetary circulation and of prices on the world market. In fact, the influence of this factor on the monetary system is so pronounced that some writers seem to see in the concentration of gold, if not the complete explanation, at any rate the principal cause of the present economic crisis, an opinion which is not, however, supported by the facts with which we are faced in 1930-31.

In the following table we give some figures showing the changes that have taken place in the gold reserves, in the rates of discount, in the note circulation and in the wholesale price-indices of the twelve principal countries that imported or exported gold in the agricultural year 1930-31. These figures may throw some light on the part played by the monetary factor in the economic crisis during the most recent period.

*Movements of Gold, of Rates of Discount, of Note Circulation and of Prices (\*).*

	Gold reserves (in millions)		Official rate of discount		Note circulation (in millions)		Wholesale price indices		Changes in the price indices %
	June 1930	June 1931	June 1930	June 1931	June 1930	June 1931	June 1930	June 1931	
Argentina (Pesos, national money)	433	337	...	...	1,314	1,230	...	...	...
Australia (Australian pounds)	19.9	15.2	6-7	6-7	44.9	50.7	152.3	123.1	— 19.2
Belgium (Belgian francs)	6,009	7,171	3	2.50	14,857	15,967	109.4	92.5	— 15.4
Canada (Canadian dollars)	145	167	...	...	174	145	137.5	93.4	— 32.1
France (Francs, notes)	44,052	56,426	2.50	2	72,594	76,927	108.1	95.0	— 12.1
Germany (Reichsmarks)	2,619	1,421	4	7	4,685	4,295	124.5	112.3	— 9.8
Great Britain and Northern Irel. (Pounds, notes)	157.2	164.0	3	2.50	363.6	120.7	120.7	103.2	— 14.5
Italy (Liras)	7,004	7,141	5.50	5.50	15,846	14,683	104.1	(a) 89.1	— 14.4
Japan (Yen)	781	851	5.48	5.11	1,291	1,161	137.0	113.9	— 16.9
Netherlands (Gulden)	432	497	3	2	843	879	118	100	— 15.3
Switzerland (Swiss francs)	579	735	3	2	929	1,078	126.2	110.8	— 12.7
United States (Dollars, banknotes)	3,012	3,383	2.50	1.50	2,056	2,360	124.4	100.3	— 19.4

(a) Bachi

The examination of these figures seems to reveal a rather interesting situation from the point of view of the influence of the monetary factor on the present development of the economic crisis. It would appear to result from the figures that the movements of gold, as well as the changes in credit conditions and the volume of note circulation, during 1930-31, can only have played a secondary part in the depression, this being caused in the main by factors other than monetary. In fact, it may be noted that, whatever direction was taken by the changes that occurred in the gold reserves, the rates of interest and the note issue, the price-indices invariably fell more or less sharply and the extent of the fall had no relation to the monetary changes. Thus in Germany, where a considerable diminution in the gold reserve led to a rise from 4 % to 7 % in the rate of discount, followed by a reduction of 9.3 % in the note issue, a considerable appreciation of the value of money might have been expected and, consequently, a more or less pronounced fall in prices. In reality, the fall in the index of wholesale prices was only 9.8 %, the smallest fall in any of the twelve countries, nine of which were importers of gold. On the other hand, in Australia, for example, a diminution in the gold reserve, not accompanied by a rise in the rate of discount, which would have compelled a restriction of credit, was followed by an increase in the issue of bank-notes of about 11 %, resulting in a slight monetary inflation. In these circumstances, one would expect a rise in prices, or, at any rate, a slowing down in the fall of prices, instead of which the Australian index-number fell by 19.2 %, one of the sharpest falls amongst the twelve countries that figure in the table. In the United States the substantial increase in the gold reserve served as a basis for an extension of credit, the rate of discount being reduced from 2.50 % to 1.50 %, and for an increase of 14.8 % in the issue of banknotes, but this has not prevented the prices from falling by 19.4 %. Amongst the countries that imported gold, only Canada substantially reduced its note circulation, and this reduction was accompanied by a fall of 32.1 % in the wholesale price-index, a change moreover also contrary to what might have been expected in a country which had increased its gold reserve. All the other countries which imported gold, without a single exception, showed falls in the price-indices varying from 12.1 % to 16.9 %.

(\*) Calculated on the data of the *Monthly Bulletin of Statistics* of the League of Nations.



These facts can hardly be reconciled with the purely monetary explanations of the crisis. They seem rather to suggest that monetary conditions, in the present phase of the depression, only play the comparatively modest part of being one of the many factors that have brought about the situation. In fact, during the post-war years, the monetary factor dominated the economic situation during two successive phases, notably during that of inflation and monetary depreciation, and afterwards during that of stabilisation. This last phase came to an end about 1927, except for certain indirect reactions due in particular to the violence with which it was often carried out, thus preventing the world economy from regaining equilibrium. In the course of the period immediately preceding the depression of 1929, the movements of prices in the different countries, as we have been able to observe from the index-numbers, were not uniform, and prices on the national markets seemed to be determined by the special conditions of the particular countries and in particular by the circumstances in which the monetary stabilisation was carried out.

This situation has changed since 1929. The fall in price since then has become general, and we have just seen that it seems to be independent of the variations in monetary conditions. It seems, in fact, that in this period the economic situation was determined by a combination of powerful influences, economic and other, to which the monetary conditions were themselves subjected. Thus, in spite of the fact that the monetary factor has not ceased to exercise influence on the economic situation, this influence can only be regarded as secondary, inasmuch as the monetary movements themselves are only results of a series of independent causes responsible for the want of balance in the world economy.

This want of balance affects all the manifestations of economic life : agriculture, industry, commerce and finance. The situation of each of these branches is determined, in the last instance, by its own particular circumstances, but there exists, for the whole world economy, a certain sum of general factors, of causes of which the influence is universal (1).

A want of equilibrium is not, in itself, a disturbance of economic life, on the contrary, it may be described as the motive power of an economic system based on competition. A perfect equilibrium would bring about a stationary condition in the world economy, while it is the change in the level of prices, which is only the economic expression of the want of balance between supply and demand, that gives to the economic system such as we know it the stimulus to activity. It is only when the want of balance is perpetuated by some obstacles that prevent the currents of economic activity from taking the channels towards which they are pushed by the difference in the relations between supply and demand, as expressed in prices, or when those activities are turned into artificial channels, that gluts and crises are produced. Thus when we speak of the present want of equilibrium, comparing it with the equilibrium of the periods of normal economic activity, such as the period immediately preceding the war, we are in fact comparing a static and unhealthy want of balance with a dynamic state of want of balance tending always to a state of equilibrium.

This was really the state of world economy before the war. The system at that time may be described as a system of free exchange of the factors of production — enterprise, capital and labour — as well as of the products, qualified by comparatively moderate customs duties, sufficient to protect the most important national industries, and by treaties of commerce regulating the economic relations of partic-

(1) See "The Agricultural Situation in 1929-30". Chap. I.

ular States. Though not a system of free trade in the theoretical and abstract sense in which the expression is used by the liberal school, the system, generally speaking, allowed the productive forces to flow towards the most remunerative employment, thus assuring to world economy a return perpetually tending to the maximum.

The war not only shook this equilibrium, but had economic and political consequences that rendered its re-establishment extremely difficult and led, by a gradual development, to the present economic crisis.

In our review of the situation last year (1) we noted, amongst the general factors of the crisis, the dissolution of the large single markets of the old world, such as Germany, Austria-Hungary and Russia, parts of which have been detached and the present frontiers of which have severed the secular relations of millions of producers and consumers. By the War, and afterwards by the Revolution, an enormous economic system, that of Russia, has been eliminated from the world market as a whole and instead of remaining a regular factor in supply and demand on the markets for products and capital, has become an extraneous factor in the world economy, acting upon it from without and keeping it in a state of uncertainty.

The war has also created, between different countries, in the form of debts and reparations, a vast system of financial charges, resulting from causes other than economic, but tending to determine the main directions in which produce, gold and capital flow.

The monetary disorganisation following the War was another factor that exercised a profound influence on the currents of international trade. When it was particularly the effects of unregulated exchanges that were felt, an improvement was expected from the stabilisation of the currencies, which was generally completed about 1927. However the stabilisation, which was often made at a level above the purchasing power parity of the national currencies and usually carried out with more regard to its financial than to its economic consequences, in many cases brought about new complications, as it established more or less artificial levels of national prices. The countries which stabilised their currencies at a level above their purchasing power parity created conditions favourable for the importation of foreign produce and, conversely, favourable for the export of money. On the other hand, those which adopted a parity below the relative purchasing power of their national currencies stimulated the export of national products and the import of gold. Between these two groups of countries there were bound to be set up, in conditions of more or less free exchange, currents of trade tending to equalise the levels of prices on the national markets. This movement, however, would inevitably have brought the different national currencies to parities corresponding with their respective purchasing power, in place of the artificial values fixed at the moment of stabilisation : a fall which it was sought by every means to avoid for financial reasons rendered imperative, particularly, by the excessive burden of the obligations to foreign countries arising out of the war.

Amongst the measures intended to maintain the exchanges the most important were the customs tariffs, and consequently the import duties, already generally raised above the pre-war figures, under the influence of the economic nationalism which characterises the present epoch, were increased and the trade in produce became more than ever hindered. High duties are sometimes imposed on the importation of products even by creditor countries, the debtors being

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(1) *Op. cit.*

thus compelled, when settling their accounts in goods, to accept for their produce prices which, when the import duties have been deducted, are scarcely remunerative ; otherwise they must sell their goods elsewhere and pay their debts in cash. In the latter case it frequently happens that, being compelled to sell more or less at any price to obtain the money that they require when payments become due, they increase the disorder in the markets and push prices, already depressed, still lower : a result usually following on the present state of the international obligations arising out of the financial consequences of the war. On the other hand, the trade in produce being hindered, the use of metal in settling international accounts has acquired exaggerated importance.

The movements of gold and its concentration appear thus to be the effect, on the one hand, of the financial charges imposed since the war on certain countries in favour of others, and, on the other hand, of the development of protectionism and of the economic particularism which prevents the circulation of produce.

The agricultural crisis, and above all the relative over-production of cereals in the overseas countries, forced the Governments to increase and to extend protection by import duties and other measures sometimes prohibitive, a phenomenon which has acquired importance particularly since 1929 and, combined with other manifestations of economic particularism, has placed international trade in extremely difficult conditions. The world market has almost ceased to exist. The countries affected by the crisis have entered on a sort of vicious circle, being in no wise able, in present conditions, to renounce the defence of the immediate interests, of the very existence, it may be, of their national producers, against foreign competition, and all of them together by their particularism and by interference with the natural movements of the exchanges, helping to destroy the world market, which alone can assure to the great industries and the great commerce of the modern economic system the possibility of expansion which is their vital need. The want of balance, instead of returning after the war to a dynamic state and tending towards equilibrium by the stimulus it applies to the currents of trade, of productive enterprise and of migration of labour from country to country, has become perpetuated and, entering a static phase, has produced a general depression of the world economy.

Such is the general background against which the different aspects of the present economic crisis must be studied. Amongst these different aspects, one of the most important, as a factor of the situation and as exercising great influence over all the others, is the agricultural depression.

As we have noted, though closely linked with the general economic crisis and sharing with it certain of the most important factors, the agricultural depression has also specific causes which we had occasion to indicate and to examine in the Economic Commentary of 1929-30.

We then examined the conditions in which the relations were established between supply and demand on the world market, and we noted the existence, in the case of certain products, of an over-production in relation to the demand, and, in the case of others, of a tendency in the same direction. An increase of production especially of cereals, took place in spite of a diminution in the demand, and a similar tendency, in forms more or less pronounced and under the influence of the industrial crisis, might be observed in the case of the majority of other agricultural products intended for immediate consumption or for transformation into manufactured goods.

In 1930-31, as during the preceding year, the fundamental fact of the agricultural situation was the fall in the price of wheat on the world market, the reaction of which was felt in all other branches of the agricultural industry.

In fact, the supply of wheat, apart from the stocks already existing in the ex-

porting countries, increased in 1930-31. The world production of wheat amounted to about 1,003 millions of quintals, without counting that of the U. S. S. R. This figure is larger than that of 1929-30, which was only 933 millions of quintals. Moreover, this increase was not merely the result of a crop larger than the average, since the area under wheat also showed, in spite of the crisis, a fairly substantial increase, the figure in 1930-31 being about 100.0 million hectares, as compared with 96.6 million hectares in 1929-30. While between 1928-29 and 1929-30 there was a diminution from 97.9 to 96.6 million hectares, in 1930-31 the area thus abandoned was more than regained by wheat. The increase occurred particularly in Europe, in Argentina and in Australia. On the other hand in the United States and Canada there was a slight diminution. The U. S. S. R., absent from the world wheat market for several years, considerably increased the area sown to wheat. The average area under wheat in the U. S. S. R. from 1925 to 1929 was 29.7 millions of hectares, whilst in 1930 it increased to 33.9 million hectares. Owing to a very favorable season, the wheat crop in the U. S. S. R. in 1930 was about 295 millions of quintals, this being a considerable increase on the average of the three preceding years which was only 206 million quintals. This heavy crop enabled the U. S. S. R. to resume the export of wheat, thereby aggravating the situation on the world market. The stocks of wheat in the principal exporting countries also increased in comparison with the previous year. The organisations established in the United States and Canada for the orderly marketing of wheat and the support of wheat prices increased their stocks, which in the two countries amounted in June 1931 to 90 millions of quintals as compared with 66.7 millions in June 1930.

Thus, in 1930-31 the situation of the wheat market was determined by an increase in the supply due to the heavy crop in Russia and the resumed exports from that country, and to the presence of large stocks which weighed on the market.

We noted that during 1929-30 the conditions of the supply and demand of the other cereals were unfavourable to the absorption of a part of the stocks of wheat. From this point of view, there was a certain change in 1930-31, caused by a general diminution in the production of rye and of feed-grains. In fact the figures for the production in 1929-30 and 1930-31 were as follows :

	1929-30	1930-31
	Millions of quintals	
Rye . . . . .	254.1	254.4
Barley . . . . .	354.8	345.3
Oats . . . . .	543.0	532.0
Maize . . . . .	1,104.8	969.0
TOTAL . . .	2,256.7	2,100.7

A diminution of 156 million quintals, or about 7 %, in the production of these four cereals could not have failed to have a more or less marked influence on their prices, had it not been for the existence of large stocks and the fact that, as noted in 1929-30, there was certainly a tendency to relative overproduction of feed-grains due to the diminution of the demand. In fact the influence which the diminution in the production of feed-grains exercised on the price of cereals was only slight and transitory, even in the United States, where the maize crop was very short in 1930 owing to the drought.

The price movements of cereals in 1930-31 may be characterised, approximately but in a manner adequate for our purpose, by the index-numbers calculated as below on the prices of the principal markets : (1)

*Index-numbers of prices of cereals (1926 = 100).*

	1916	1927	1928	1929	1930 (first half-year)	1930 (second half-year)	1931 (first half-year)
Wheat . . . . .	100	87	83	79	72	54	43
Rye . . . . .	100	116	117	99	65	50	40
Barley . . . . .	100	123	123	103	76	58	54
Oats . . . . .	100	115	130	114	91	68	59
Maize . . . . .	100	105	137	130	95	82	62

This statement shows clearly the extent of the fall of the prices in the course of the last two farming seasons, the index-numbers for the first half year of 1931 being for wheat, rye and maize in particular less than half the 1929 figures.

As to the real tendencies in the production of cereals, of which one can only judge by the development of the sown areas, in 1930-31 there are no unquestionable indications as yet of a really significant change. The area of the five principal cereals changed as follows.

	1929-30	1930-31
	Millions of hectares	
Wheat . . . . .	96.6	100.1
Rye . . . . .	19.0	19.6
Barley . . . . .	29.6	29.0
Oats . . . . .	42.3	41.9
Maize . . . . .	76.2	76.4
WORLD TOTAL . . .	<u>263.7</u>	<u>267.0</u>

It will be seen that, in spite of the extremely sharp fall in prices, the extension of the cultivation of cereals in general continued in 1930-31. In the case of wheat, the situation in this respect in the principal producing countries was as follows.

	1929-30	1930-31
	Millions of hectares	
Europe . . . . .	28.4	29.8
United States . . . . .	24.9	24.5
Canada . . . . .	10.2	10.1
Australia . . . . .	6.1	7.4
Argentina . . . . .	6.4	8.0
India . . . . .	12.9	12.8

(1) Wheat — Winnipeg (Manitoba No. 1), Chicago (Hard Winter No. 2), and Buenos Aires (Barletta); rye — Minneapolis No. 2, Groningen (home-grown) and Copenhagen; barley — Winnipeg No. 4, Chicago (White No. 2) and Liverpool (Danubian No. 3); oats — Winnipeg, Chicago and Buenos Aires; maize — Chicago (American mixed), Buenos Aires (Yellow Plate) and Braila (Danubian).

These index-numbers, with the exception of those for wheat prices, differ from those given in the *Economic Commentary* for 1929-30 on account of a change in the selection of the prices utilised in the calculation made with the object of obtaining more representative results.

The adaptation of production to prices met with difficulties in certain regions dependent or nearly dependent on the single crop of wheat, as well as in the European importing countries which endeavoured to find means to enable them to maintain the area under wheat. It is in fact only on the areas sown for the crop of 1931-32 that the provisional statistics make it possible to observe a certain reduction due to the price falls on the world market.

In the grain-importing countries an attempt was made to help home production by means of customs protection, by restrictions on imports or on the use of imported grain in milling, by propaganda in favour of national products, by monopolies of importation or by its complete prohibition. In exporting countries efforts were made to organise the orderly marketing of produce, to regulate the markets or to reduce as far as possible the costs of production so as to enable a profit to be made in spite of the fall in prices. In fact, the attitude both of the Governments and of the organised producers towards the fall in the price of wheat on the world market was essentially the same in 1930-31 as in 1929-30. The measures that were contemplated or carried out in the course of the previous year were continued and extended, according to the needs of the country or group of countries interested. The policy of the various countries towards the crisis became clearly defined in 1930-31, and in certain cases the measures by which it was, or is, sought to combat the crisis or at any rate to check certain tendencies which characterise the depression, have had the opportunity to show their efficacy or, on the contrary, their weakness. The realisation of the true interests of the particular countries in present conditions, as well as of the bonds of solidarity between countries having interests in common on the world market and of international economic antagonisms, has led to attempts at forming economic groups, the component countries of which endeavour to exert an influence on the market situation. In all the international meetings which, in the course of 1930-31, dealt with agricultural problems, this crystallisation of interests, of solidarity and of antagonism has made itself felt in the most unmistakable manner.

Thus we have seen the formation of a group of overseas countries that are exporters of agricultural products, such as the United States, Canada, Argentina and Australia, to name only the most important. These countries, since Russia ceased to play its former part as a regular exporter of cereals, together furnish about 90 % of the supply of wheat on the world market, as well as a large proportion of the supplies of other agricultural products. For these countries, which possess vast regions in which there is no alternative to the extensive cultivation of wheat, and where, generally speaking, the natural and economic conditions favour the development of the cultivation of a single crop, be it wheat, maize, cotton or sugarcane, the most urgent and most difficult problem to solve is that of finding the means of enabling the existing system of agricultural production to be maintained, by ensuring the regular marketing of the crop, by seeking to reduce the cost of production in proportion to the fall in the price of the products and, as far as possible, by encouraging the gradual replacing of unremunerative crops by others which, in the special conditions of the country, may give a higher return.

In this group of countries, in fact, since the beginning, in 1929, of the present depression, the efforts both of the public authorities and of the voluntary organisations of the producers, have been directed to the improvement of the methods of marketing the produce, to the stabilisation of the selling prices and to the rationalisation of production with a view to bringing the cost of production into line with the low prices on the world market.

To this class of measures belongs the step taken by the United States in the

passing of the Agricultural Marketing Act of 1929. This Act constituted the Federal Farm Board with its system of co-operative organisations, such as the Farmers' National Grain Corporation, the American Cotton Co-operative Association, the National Livestock Marketing Association, etc. The object of this organisation, provided with huge financial resources placed at its disposal by the United States Treasury, is on the one hand to create national organisations of producers which may act with a united front on the market, and on the other hand to ensure a certain control of prices, with a view to stabilising them. This latter object necessitated the creation, for cereals, of the Grain Stabilisation Corporation which, with the aid of the credits supplied to it by the Federal Farm Board, has entered the market in the endeavour to eliminate, by purchase and storage, all the surplus that was depressing the prices below what was considered as the necessary minimum and was represented by the prices offered by the Corporation. While endeavouring to maintain the prices of cereals by means of this intervention, the Federal Farm Board sought also to persuade the farmers to reduce the area under wheat and to replace it by other crops, an effort of which the experience of 1930-31, according to the opinion expressed by Mr. Legge, then President of the Federal Farm Board, has shown the futility. In fact the price policy followed by the Board through the medium of the Grain Stabilisation Corporation could scarcely favour the success of such propaganda.

While in the United States the efforts to check the fall in price came from the Government, and the co-operative organisations created under the auspices of the Federal Farm Board owed their origin to official initiative, in Canada there has been truly co-operative action on the part of the producers, the three wheat Pools of Manitoba, Saskatchewan and Alberta, with their central selling agency, the Canadian Wheat Producers Ltd., being voluntary organisations constituted by the farmers on their own initiative. The Governments of the three Prairie Provinces only intervened indirectly in the work of the Wheat Pools, when at the beginning of 1930, the Pools found difficulty in obtaining credit from the banks and the provincial governments agreed to guarantee additional loans up to 15 % of the amounts already advanced by the banks. When, on the other hand, they were asked to guarantee advances on the crop of 1930 the Provincial Governments refused to do so and it was only after a long period of hesitation that a guarantee in respect of these advances was granted by the Federal Government. In all their operations the Canadian Pools acted, notwithstanding this indirect financial support, as free co-operative societies, but their objects are essentially the same as those of the Federal Farm Board, in fact, like the Board, they have aimed at the organisation of marketing and at the stabilisation of prices, primarily that of wheat, by systematically adjusting the supply to the demand.

As in Canada, the efforts to stabilise prices of cereals in Australia were made, in the first instance, by voluntary pools, the attempts to organise compulsory pools having failed. However, since the end of 1930, the Federal Government has intervened by giving guarantees in respect of advances on wheat and thus supporting the initiative taken by the producers' co-operative associations.

We see then, on the part of the principal overseas exporting countries efforts, to organise the marketing of their products — primarily wheat — and to stabilise prices on the world market, on which these countries depend. The efforts made with this object by all these countries during the agricultural years 1929-30 and 1930-31 on national lines are one of the most remarkable features of this period, and are highly characteristic of the present epoch in which it is being endeavoured to establish a system of "organised economy". In 1929-30 we saw the beginnings

of these attempts, the realisation and extension of which in 1930-31 seem to have constituted a very useful fund of practical experience, from which some conclusions may be drawn.

One of these conclusions — perhaps the principal one — seems to be the impossibility, even for the most important exporting countries, to succeed in efforts to check the fall in prices on the world market and to stabilise prices by purely national methods without making agreements with other exporting countries which will bring about concerted action on their part. Failing such an agreement, at any rate between the principal exporting countries, the efforts of single countries are futile and can only lead to expenses which are often enormous and to the accumulation of huge stocks the disposal of which, in the best of hypotheses, is problematical.

During the agricultural year 1930-31 there was abundant evidence of a desire, on the part at any rate of certain exporting countries, to arrive at some agreement with the others. This desire found expression at the Wheat Conference at Rome in March 1931, as well as in the convening in London in May 1931 of a Conference of representatives of the wheat-exporting countries, in which all such countries in the Old World and in the New took part. The Conference did not arrive at any solution or practical agreement; in fact, it served rather to throw into relief the essential differences between the points of view of the various countries whose only common interest is that which they have in the price of wheat.

Even amongst the overseas exporting countries, the attitude towards the wheat problem taken up by the United States, a highly industrialised country with a diversified production and a domestic market which by its capacity dominates the situation and reduces the importance of foreign outlets, could not be the same as that of Canada or of Australia. It is not surprising, therefore, that the United States was not able to tie its hands by an agreement which might, in certain circumstances, restrict its freedom of action.

Another country which does not belong to any group, in spite of the great part which it played in the past and will inevitably play in the future, is Russia. The U. S. S. R. which, during the year 1930-31, reappeared on the world grain-market, differs from the rest of the world in its political economic and social organisation, and apart from its natural interest in the prices of the products that it exports, it occupies a place apart in world economy. Besides, the rapid industrialisation of the country contemplated by the Five-Year Plan incites it to increase its exports, even at the expense of home consumption, whilst the organisation of external trade, as well as the purchase of agricultural products in the country itself, are both based on a State monopoly and make it possible to export at prices below even the present depressed level of the world market and at the same time to make a certain profit for the monopolist Government. On the world market the U. S. S. R. appears, therefore, in opposition to all the efforts that the other exporting countries are making to stabilise prices by adjusting the supply to the demand. In its present situation, the U. S. S. R. must be free to place on the foreign market every thing it has available for export, in order to obtain the means of paying for the machinery and materials it must import for its industries. It is this necessity that principally determined the attitude of the Soviet Union towards all attempts made by the countries that export agricultural products to persuade it to adhere to plans of concerted action on the world market.

Beside the overseas exporting countries and the U. S. S. R. must be placed the group of European exporting countries, which includes Bulgaria, Hungary, Poland, Roumania and Yugoslavia. Although these five countries only play a comparatively modest part in the world market for agricultural produce, in their own eco-



nomies, which rests almost exclusively on agriculture, export fills a function essential to their economic and financial prosperity and the present crisis affects them very seriously. Besides, the present depression reduces their power of purchasing the manufactured products they import and thus aggravates the industrial crisis, whilst from the political and social points of view the effects of the crisis in this group of countries present a formidable danger. From another point of view, this group is particularly interesting, as here an attempt has been made to carry out the idea of concerted economic action, an attempt which dates from the Conference of Warsaw held in August 1930. At the meetings of the Commission of Enquiry for European Union, at the Wheat Conference in Rome and at that of the exporting countries in London, these countries have been represented and have shown a united front, their interests being sometimes in harmony with those of the overseas countries, sometimes opposed to them.

This group of countries, being keenly interested in the European market for the disposal of their products, is in a very difficult economic situation in consequence of the depression of prices and the protectionist policy of the European importing countries which tend more and more to reduce their exports.

The programme proposed by the Conference of Warsaw in August 1930, which has been the basis of the subsequent actions of this group, includes measures for improving trade methods in each of the component countries, such as the organisation of national institutions for this purpose, as well as co-ordination of the study of markets made in the different countries. It was decided to summon each year a Conference of the persons responsible for the economic policy of the component countries, in order to co-ordinate their work. It was recognised that it is necessary for the countries composing the group to maintain a common attitude in regard to agricultural questions submitted to international discussion. The Conference also recognised the necessity of approaching the League of Nations, with a view to obtaining the abolition of export premiums and a preferential treatment, on the part of European importing countries, in favour of agricultural products of European origin.

The programme of action thus laid down has served as the basis of subsequent action of the countries of this group, both in the countries themselves and in the course of international discussions, in which the spirit of co-ordination inspiring their efforts enabled the countries of this group to make their influence felt. Thus it was that certain problems, such as that of preferential treatment and the closely related question of the most favoured nation clause, were definitely placed on the agenda of the international meetings dealing with agricultural questions. These are problems very difficult to solve, but the discussion of them serves to throw light on certain important aspects of the existing system of international trade and might lead to important measures of adjustment. In relation to other exporting countries, the demand for preference addressed to the European importing countries, places this group in a position of antagonism, as those countries, which enjoy rights acquired in virtue of the most favoured nation clause in their commercial treaties, will not consent to part with them. However, in regard to measures for the stabilisation of prices by concerted action, the two groups of exporting countries are usually in agreement, but cannot act because of the abstention of the United States and of the U. S. S. R.

Thus, notwithstanding their common interest in the stabilisation of the prices of agricultural produce on the world market, the exporting countries do not represent a homogeneous group which could act together, except in a very limited field. Their interests, as producers, are not identical, owing to the very different parts which

the various branches of agriculture — the cultivation of one cereal or another, cotton-growing, the production of sugar, stockbreeding dairying, and so on — play in their economic organisation, and the fact that certain developments of the markets, while harmful to some of these branches, may be favourable to others. Besides there exist certain rights acquired by the various countries, and they are rarely ready to renounce them in exchange for advantages which may appear to them to be problematical. Lastly, a country while interested in selling to advantage the products it exports, may prefer, for reasons of national economic policy, to reserve to itself complete liberty of action in foreign markets. The result is that, when it is proposed to make an international agreement with a view to the stabilisation of prices necessitating a limitation of the supply of products on the world market by means of quotas more or less rigidly fixed for the countries signing the agreement, unanimity is not attainable and the effort cannot succeed.

At the present time, the exporting countries may be divided into three groups according to the way in which their respective attitudes have become defined :

(1) The group of new countries, in which cultivation is extensive and is primarily for the world market, such as Canada, Australia and Argentina. The countries of this group, which are vitally interested in the price that the foreign buyer offers them for the limited number of agricultural products they sell, are the principal exponents of the idea of concerted international action for the stabilisation of prices on world market.

(2) The group of Eastern European exporting countries, the economy of which is essentially based on small peasant farming and which cannot assure the existence of their agricultural populations under a system in which prices are fixed by the competition of the new overseas countries, with their extensive cultivation. The countries of this group are seeking to obtain a privileged position on the European markets, a demand to which the other exporting countries are opposed on the ground of the rights they enjoy under the most favoured nation clause.

(3) The large countries which export agricultural produce but have a more complex and more highly developed economic system than the new overseas countries, and cannot, therefore, regard agricultural problems in so simple a manner as the countries which depend more or less completely on the export of products. This class includes two countries, very different in their economic and social organisation and in the principles of their policy, but resembling one another in the diversity and abundance of their resources and of their forces of production. These two countries are the United States and the U. S. S. R., which between them were responsible in 1930 for about 44 % of the total area in the world sown to wheat and 40 % of the world production. As to their exports of wheat, in 1930-31, these two countries placed on the world market a total of 59.4 millions of quintal, or about 30 % of the total quantity that entered into international trade.

In these circumstances, it is obvious that the attempts made in 1930-1931 to ensure the maintenance of prices on the world market could not be successful whilst the efforts made by exporting countries on their own markets could only succeed on condition of being supported by international agreements.

The problems present themselves in a very different form in the industrialised countries of Europe which must import agricultural products both for the direct consumption of the inhabitants and for transformation into manufactured articles. In these countries it is necessary to find a compromise between two points of view which it is not always easy to reconcile. On the one hand, in so far as these countries have a more or less important industrial population and industrial production, it is to their interest to obtain imported foodstuffs and imported raw materials at the

lowest possible prices. On the other hand, in regard, at any rate, to the imported products which compete directly, or indirectly by way of substitution, with the products of the agriculture of the country itself, and in so far as the maintenance of agriculture is considered sufficiently important to justify the State in protecting it, the question arises of creating a system which, while safeguarding industrial and urban interests, will also ensure the preservation of the national agriculture. During the great depression at the end of the 19th century, the principal industrialised countries of Continental Europe, in fact, established a protectionist system embracing the manufacturing industries as well as agriculture, in which they endeavoured to conciliate these different interests.

By import duties on foreign products an attempt was made to place the national production, organised on intensive systems, in a position to meet the competition of the extensive production of the exporting countries. The object it was sought to attain was only to equalise the cost of production, which did not then include all the unproductive expenses that have added, since the war, to the cost of European agricultural production. On the other hand, the mechanisation of agriculture overseas on the eve of the War had not proceeded so far as to threaten European agriculture as much as it does at present. Thus the difference between the costs of placing the products on the market was not so great as it is at present and the duties necessary to equalise them were comparatively moderate.

At present the situation from this point of view is very different, partly on account of the increase of various items in the cost of agricultural production, notably the increase of the social and fiscal charges which burden European agriculture and of wages, partly owing to the fact that in Europe agriculture does not lend itself to mechanisation so readily as the extensive cultivation of the new countries, and to the dearth of credit. The difference between the cost of production in Europe, on the one hand, and in the overseas exporting countries on the other hand, is much greater than before the War and even apart from all other political and economic reasons that urge the post-War world to an exaggerated protectionism, this explains a considerable increase in customs tariffs. In fact, the import duties on wheat in force in 1913 and in July 1930 were as follows :

	1913	July 1930
	Gold francs per quintal	
Germany . . . . .	6.79	18.52
France . . . . .	7.00	16.24
Italy . . . . .	7.50	16.50

It will be seen, therefore, how greatly the import duties have increased since the War. During the agricultural year 1930-31, which has been marked by a determined struggle against the fall in agricultural prices which had become very marked and was ruining the farmers in both the importing and the exporting countries, further increases took place in certain countries. Thus in Germany, the general import duty on wheat amounted, in July 1931, to 30.93 gold francs per quintal ; in the case of privileged importation, for the mills, it was 24.75 gold francs, and, for the starch factories, 13.92 gold francs. The import duty on rye in Germany was 24.75 gold francs in 1931 as compared with 18.52 gold francs in 1930 ; on barley the general duty was 24.75 gold francs as compared with 14.81 gold francs ; on oats 19.75 gold francs as compared with 14.81 gold francs. In France the import

duty on wheat remained approximately the same, being 16.32 gold francs as compared with 16.24 gold francs; the proportion of imported wheat permitted in flour intended for bread-making had, however, been reduced to 3 per cent. since the end of 1929, and this is practically equivalent to a prohibition of the importation of wheat. On rye imported into France the duty payable was 7.11 gold francs in July 1931, as compared with 4.26 gold francs in 1930. In Italy during 1930-31 the duties were not increased. All the same, even in the countries in which the import duties on, agricultural products were not increased in 1930-31, they had already, at the beginning of that year, been pushed to the furthest possible limit and in many cases had reached figures exceeding the price of the products on which they were imposed. Thus in July 1930 and July 1931, the relations between the import duties on the principal cereals in Germany and the prices of the same cereals on the free markets of London and Liverpool, were roughly as follows:

	Price, in gold francs per quintal in London and Liverpool		Import duty in Germany, in gold francs per quintal	
	1930	1931	1930	1931
Wheat . . . . .	20.00	12.00	18.52	30.93
Rye . . . . .	17.00	—	18.52	24.75
Barley . . . . .	11.00	11.00	14.8 to 18.52	24.75
Oats . . . . .	10.50	9.20	14.81	19.75
Maize. . . . .	14.00	8.80	3.09	Monopoly

In Spain the import duty on wheat in 1930-31 was 21.00 gold francs per quintal; moreover, importation was only authorised when the price of wheat in Castile reached 53 pesetas (29.11 gold francs) per quintal, a principle reminiscent of that the former English "Corn Laws". On other cereals the import duties were fixed at prohibitive heights. In Switzerland and Norway the State reserved to itself the monopoly of the export of cereals. In fact, in face of the fall in prices, all countries are endeavouring to surround their home markets with a rampart of duties and prohibitions for the purpose of protecting the national agriculture and the very existence of whole classes of their population that live on the land. Great Britain alone, faithful to its tradition of free trade and not concerned for the fate of the peasant class, which has long since disappeared in this country, where all energies are primarily directed to the achievement of industrial and commercial progress, still left its market open to imports, in spite of the fact that, there also, the current of protectionist opinion was becoming stronger and preparing the revolution in commercial policy that took place in the autumn of 1931. The only important breach in the tariff walls surrounding the markets of importing countries was closed by this revolution in the commercial policy of Great Britain, and in 1931-32 we shall be in presence of a system of universal protectionisms.

Moreover, modern protectionism is not the same as pre-war protectionism, either in its character or in its influence on world economy. It has no longer the character of a moderate safeguard given to it by List and his school; in the determined struggle that is being carried on by the older and more advanced countries against the economic crisis and against the combination of natural resources and technical means with which the new countries are pushing their offensive, protectionism has become fiercer than ever.

And it is not only in the height of the barriers which it sets up against international trade that protectionism of to-day differs from pre-War protectionism; it is also in the increase in the number of these barriers and in the splitting up of the great unitary markets of Europe, to which we have already referred in the "Economic Commentary" of 1929-30 in speaking of the origins of the agricultural crisis.

Thus, in spite of all the efforts that have been made to find a solution for the wheat problem by national measures or by international agreements, the fall in the price of cereals continued to dominate the general agricultural situation. Besides, as we have already noted, the agricultural situation did not depend only on specific factors, such as the relations between the supply and the demand of the various products on the world market, but was to a large extent determined by the general economic situation. In fact, during the year 1930-31, the general economic crisis became much more acute and the consequences were very serious for agriculture and tended to put agricultural production in a more and more difficult position.

Since the beginning of the agricultural depression of the post-war period, as during the agricultural crisis at the end of the 19th century, a tendency may be observed on the part of the farmers to replace cereals by other crops and, even more, to substitute animal husbandry, in the form of stockbreeding and dairying, for arable farming, the returns from which were diminishing under the influence of overseas competition. This tendency was particularly marked in the free trade countries, in which the farmers were left to carry on the struggle unaided. In fact, in England and Wales, from 1871 to 1911 the area under cereals decreased by about 30 per cent., while permanent grass land increased by 42 per cent. During the same period the head of live stock increased, by 27 per cent., and that of dairy cattle by 31 per cent. In the course of the post-war depression the same phenomenon may be observed, the diminution in the area under the three principal cereals in Great Britain between 1918 and 1929 having been about a million hectares. The head of live stock, on the other hand, has increased, the maximum number being reached in 1927. In other countries, in which agriculture enjoyed a more or less effective protection against foreign competition, this tendency, at present, as well as during the pre-war crisis, was not so clearly apparent, but, all the same, it was more or less universal, inasmuch as animal husbandry offered opportunities of a better return owing to the improvement that had taken place in the standard of living of the great masses of consumers. Stockbreeding, dairying, poultry-keeping and the cultivation of vegetables and fruit have all developed since the war, partly in response to the demand of new classes of consumers, whose purchasing power has increased particularly owing to the absorption in industrial occupations since the war of large numbers of women, whose earnings increased the family budgets of the working classes.

Seeing that the very possibility of such a development depended primarily on a general increase in the purchasing power of the consumers, a diminution of their purchasing power must inevitably lead to a restriction of the capacity of the market for these products and to a fall in their prices. In a period of world crisis such as the present, the depression of all economic activities naturally reacts above all on the market for the finer products, which, in case of necessity, can be dispensed with, thus reducing the effective demand.

In fact, during the years 1930 and 1931, industrial and commercial activities throughout the world have undergone an extremely serious reduction, the economic crisis having become more serious and more widespread.

In order to convey a more precise idea of this decline in economic activities, some illustrative figures are here given.

Thus, in the index-numbers of industrial production in the principal industrialised countries a very marked decline may be noted (1).

*Index-numbers of Industrial Production.*  
(1928 = 100).

	<u>1928</u>	<u>1929</u>	<u>1930</u>	<u>1931 (six months)</u>
Germany . . . . .	100.0	101.4	83.6	72.6
United States . . . . .	100.0	107.2	87.4	78.1
France . . . . .	100.0	109.4	110.2	102.9
Great Britain . . . . .	100.0	106.0	97.9	87.3 (June)

Only France, in 1930, continued to increase its industrial production partly owing to the conditions created by the stabilisation of its currency at a rate of exchange which has not been forced above its purchasing power parity. However, in 1931, even France felt the influence of the universal crisis.

The decrease in commercial activity in the principal countries for which statistics are available is marked by the fall that may be noted in the figures for railway traffic. In fact, the goods traffic on the railways has changed as follows : (1)

*Goods Traffic on Railways*  
(in millions of ton-kilometres per month).

	<u>1929</u>	<u>1930</u>	<u>1931 (six months)</u>
Germany . . . . .	5,745	4,556	4,007
United States . . . . .	59,847	51,357	42,412
Great Britain . . . . .	2,570	2,429	2,230
Italy . . . . .	1,017	1,024	910 (5 months)

The statistics of the unemployment resulting from the reduction in economic activity shows even more clearly the extent of the decrease in the purchasing power of the great mass of consumers that must have been brought about by the crisis. The increase in the number of unemployed since 1929 is, in fact, the most serious feature in the whole present situation.

*Number of Registered Unemployed (in thousands).*

	<u>December 1929</u>	<u>June 1930</u>	<u>December 1930</u>	<u>June 1931</u>
Germany . . . . .	2,850.8	2,640.7	4,383.8	3,953.9
France . . . . .	11.2	10.2	22.9	51.4
Great Britain . . . . .	1,344.2	1,911.7	2,599.8	3,706.8
Italy . . . . .	430.1	344.2	663.9	597.8

(1) *Monthly Bulletin of Statistics*, published by the League of Nations.

In the United States, the index-numbers of the degree of employment, taking 1926 as base (1926 = 100), have changed as follows :

December 1928 . . . . .	95.5
June 1929 . . . . .	98.8
December 1929 . . . . .	91.9
June 1930 . . . . .	85.5
December 1930 . . . . .	75.1
June 1931 . . . . .	72.2

In December 1930, in Germany, of the total number of workers who were members of trades unions, 31.7 per cent. were completely without employment while 16.9 per cent. were only partially employed. In Great Britain, the percentages of insured workers registered at the same date as unemployed were 14.9 and 5.3 respectively.

It may well be imagined to what an extent so serious a crisis must have reduced the purchasing power of the population of the industrialised countries and diminished the capacity of the market for those products in the production of which agriculture has hitherto sought a solution of the crisis in cereals. A tendency to a relative overproduction of milk with a certain reaction on prices was already noticeable in 1929. What takes place in regard to milk, must necessarily take place in regard to the other finer and more costly products of agriculture, the demand for which is very elastic and follows closely the changes in the purchasing power of the great masses of consumers.

In fact, we find that in Germany the index-numbers of the prices of live stock and of animal products (taking 1913 = 100) have changed as follows :

	<u>1929</u>	<u>1930</u>	<u>June 1931</u>
Live stock . . . . .	126.6	112.4	81.5
Animal products . . . . .	142.1	121.7	103.3

In the United States, the course of prices (taking the average of 1909-10 to 1913-14 = 100) was as follows :

	<u>1929</u>	<u>1930</u>	<u>June 1931</u>
Fruit and vegetables . . . . .	136	158	114
Butchers' beasts . . . . .	156	134	91
Dairy products . . . . .	140	123	86
Poultry products . . . . .	159	126	81

In the Netherlands, the index-numbers of the prices of animal products, taking those of the period 1924-25 to 1928-29 as base, were 95 in 1929 ; 77 in 1930, and 71 in June 1931.

In England, the index-numbers of the prices of live stock and live stock products, taking those of 1911 to 1913 as base, were 152 in 1929 and 147 in 1930 (1).

Thus, in the course of the last two years, since the beginning of the present phase of the post-war economic depression, the agricultural crisis has extended to products which, previously still enjoyed a relatively favourable position. This was an inevitable result of the increased seriousness of the general economic crisis, which has reduced the purchasing power of the masses in face of an increase in the supply of the products of intensive and costly cultivation.

The crisis having thus become more acute and having extended to branches of agriculture that had previously been more or less sheltered from the general depression, the farmers are in a position that is all the more difficult inasmuch as the cost of production cannot be reduced in proportion to the fall in the prices of agricultural products. Although, as a result of the fall in the prices of industrial products, certain materials and instruments of production may cost less, and certain economies may be possible in wages, either by their reduction or by the rationalisation of labour, there are factors in the cost of production that do not lend themselves to such a reduction. Taxation, which is particularly heavy in the countries that took part in the War and are undergoing the consequences; the social charges resulting from the spirit of modern social legislation, and, lastly, the burden of mortgage debts, the amortisation of which represents a fixed item in the expenses of agriculture, and of short term loans which, in many countries, especially in Central and Eastern Europe, can only be obtained at usurious rates of interest, all these items are represented by fixed and irreducible figures. In these conditions it is only natural that the farmer frequently finds himself unable even to cover his expenses and that, in fact, in many cases agricultural production results in actual loss and is only carried on by drawing upon the working capital, which is swallowed up by the crisis.

GEORGE PAVLOVSKY.

## BIBLIOGRAPHY ON ECONOMIC AND SOCIAL QUESTIONS

SCHMITT, Alfons: *Die Weltwirtschaftskrise*. Junker und Dünhaupt Verlag, Berlin, 1931. (*Wirtschaftsprobleme der Gegenwart*, No. 15) (Pp. 70).

[The author starts from a brief survey of the developments leading to the present world crisis, and then gives an account of the course of the depression in Germany, England, the United States and France. After this he proceeds to the examination of the supposed and the real causes of the crisis. From the outset, the author makes his own view of the nature of the crisis clear, saying that, first and foremost, it is determined by the usual course of cyclic fluctuations, but that in the present case the situation is complicated by the simultaneous action of other factors, some of them structural. Among these latter, the agricultural crisis is the most important.

The search for the causes of the crisis has led to many erroneous conclusions and to the recommendation of remedies the practical application of which was sometimes dangerous. The author rejects the view which explains the crisis and the growth of unemployment by the rapid rationalisation of industries. The saving in labour achieved in some branches of production, unless the natural process of adjustment is impeded by obstacles put in its way, brings with itself the cure of the evils it has created, though it may and does cause temporary unemployment. The present trouble is due not to rationalisation as such, but, in the first instance, to the lack of capital and the uncompromising attitude of trades unions to any reductions in wages, necessary to effect the adjustment. Equally mistaken is the theory which attributes the present crisis to the excessive increase in productive investments at the expense of the resources available for the purchase of articles of immediate consumption. The author also refuses to accept the explanation of the crisis by the great increase in the proportion of people who live on industrial earnings, as well as by the rapid industrial development of the colonies. The real cause of the crisis, according to the author, is to be found in the course of cyclic fluctuations due to a complex system of causation, and at present aggravated by certain structural maladjustments inherent in post-war economy. The heavy fall in prices which distinguishes the present depression is accounted for by increased offer of goods on



a market whose effective demand diminishes. This diminution in the effective demand is produced by cyclic fluctuations, and makes itself felt in both industry and agriculture. In agriculture, the cyclic depression is most strongly felt by the branches producing raw materials of manufacture, as for these the demand is more elastic than for the staple articles of consumption. Agriculture is pushed to rationalisation, while with the fall in prices the marginal producers are being eliminated. This produces a great disturbance in the economic system, as adjustment is rendered difficult by various causes, and especially by the deliberate interference with economic processes by means of customs duties valorisation schemes and other expedients. The agricultural crisis was delayed in its coming by these measures, and when eventually it came, it happened to coincide with the negative phase of the business cycle, thus greatly aggravating its effects. In certain important branches of industry the author recognises the presence of over-production. While he considers that the rôle of the monetary factor in the crisis is often exaggerated, he recognises the importance of monetary conditions in the present situation. Interference with the free play of economic forces, in all its various forms, he places among the important causes of the present economic difficulties.

The most effective remedy against the depression is to be found in the economic system itself, if left free to work its own salvation through the working of the mechanism or prices by which economic adjustments are effected, and a wise economic policy is the one which helps this automatic adjustment.

This small book makes interesting reading and gives food for thought on some of the most vital problems of our day].

H. BELSHAW, M. A. (N. Z.), Ph. D. (Cambridge) : *The Provision of Credit, with special Reference to Agriculture. With two chapters upon the Provision of Rural Credit in England by R. R. Enfield.* (VIII + 326 pp., W. Heffer & Sons, Ltd, Cambridge, 1931).

[The book under review, written by the Professor of Economics and Dean of the Faculty of Commerce of Auckland University College, "has been undertaken in an endeavour to meet the need" . . . "for a book which combines an analysis of the nature of the credit problem as it affects farming industries and a critical account of some of the more important types of credit intermediary". Accordingly, the author begins by introducing his readers to the fundamental concepts of capital, credit and the supply and demand of credit facilities in general, and then proceeds to examine the credit problem in its special application to the agricultural industries. In this second part of his treatise, dealing with the Problem of Rural Credit, he dwells at length on the peculiarities of agriculture, in so far as they affect its credit needs and the supply of facilities by which they can be met, and classifies the types of rural credit according to three different principles, namely according to purpose, to length of loans and to nature of security. While accepting this threefold classification as essentially sound, one cannot help feeling that the coupling of the types in the grouping according to purpose under (a) — Settlement and Development Credit — and under (b) — Production and Equipment Credit — can hardly be accepted, as in both cases two essentially different forms of needs and of credit facilities are concerned. Settlement requires long-term credit on mortgage of holding, while development credit may take three different forms, according to the nature of the operations to be financed: the need may be met by a general land mortgage, by a suitable form of improvement or reclamation loan, or by intermediate credit. In the case of production credit short term loans generally meet the requirements, the need being in working capital, while to pay for farm equipment one has to have recourse, as a rule, to intermediate credit. Thus in any systematic arrangement these four different forms ought to be kept separate.

After having expounded the elements of the rural credit problem, Prof. Belshaw proceeds to examine, in Part III, Long Term Credit Agencies. Among providers of long term credit to agriculture, he examines first the "outer market", that is the provision of loans by private persons, mostly sellers of holdings accepting mortgages for part of the price, by dealers and by insurance, trust or loan companies investing their balances in farm mortgages. Then he deals with long term loans by commercial banks, and finally comes to the special land mortgage institutions. Here, in the first instance, he deals with the German *Landschaften*, and then takes up the U. S. A. Federal Farm Loan System, analysing its organisation and principal characteristics. Finally, we find a very interesting account of the organisation of long-term credit in New Zealand, from the private sources of mortgage credit on land and the rôle played by commercial banks to the activities of the Long Term Mortgage Branch of the Bank of New Zealand, the State Advances Department and the Public Trust Office. In New Zealand, we are

told "it is desirable, in the social interest, that resources should move more freely into agriculture. In part, this end would be achieved if the disabilities under which large financial institutions labour as the result of the present system of company taxation were removed, but of greater importance is an improvement in the basis of farm mortgage security and the development and extension of institutions especially constituted to meet the particular needs of long term farm finance". A chapter on Long Term Credit in Great Britain, by Mr. Enfield, concludes this part of the book.

Part IV, dealing with Short Term and Intermediate Credit Agencies, follows the same plan as the preceding Part, starting from an examination of private sources of credit and commercial banks, and then giving an account of co-operative credit institutions of the Raiffeisen and Schulze-Delitzsch type, with some observations concerning the failure of these to take root in Anglo-Saxon countries. A special chapter is devoted to the organisation of intermediate credit in the United States under the Agricultural Credits Acts of 1923, while in another an account is given of the organisation and working of short term and intermediate credit institutions in New Zealand. Short term agricultural credit in Great Britain is dealt with in a chapter written by Mr. Enfield.

The Appendices contain a Note on Amortisation, a short account of the history and organisation of the *Crédit Foncier* in France and notes on agricultural credit institutions in South Africa.

The book, which avowedly does not pretend at covering more than a part of the ground of the agricultural credit problem, can be recommended as a succinct and reliable source of information on the subjects it deals with].

MÜLLER (Prof. Dr. August) : Die Deutsche Volkswirtschaft. Die gestaltenden Kräfte und das Wirtschaftsbild. Verlag der Deutschen Buchgemeinschaft. Berlin 1931. Seiten 342.

[The crisis which at the present time is so severely affecting German economic life makes it the more imperative to take stock, as it were, of the form assumed by the national economy, noting the elements that are most affected, and those which can most successfully put up a resistance against the general depression. This book is calculated to give such information in the best possible way. Dr. Müller was for a long period a member of the *Reichswirtschaftsrat* (Economic Council of the Reich) and hence has had the opportunity, as well as from his collaboration on the *Enquete-Ausschuss zur Untersuchung des deutschen Wirtschaftsleben* (Committee for the study of the economic life of Germany), of becoming thoroughly acquainted with the various forms and problems of the national economy.

The analysis of the economic structure of Germany is undertaken by the writer on completely objective lines, and as far as possible he abstains from pronouncing judgements, whether political or social. The reader is thereby made acquainted with the economic facts, while no attempt is made to influence his opinion or his attitude. Each branch of the national economy — agriculture, industry, trade, business — is not merely separately characterised but also as the complementary part of the whole system, and thus the general view of the whole is never lost. Much of interest is to be found in the volume in regard to the forms of organisation, alike of industry and of agriculture, the price formation of agricultural products, the supply of and demand for foodstuffs in the country and the possibility of meeting the demand by home production, the grouping, professional and social, of the German people, the phenomenon of birth control and its effect on the economic life, etc.

Dr. Müller discusses the economic system now prevailing from the sociological and evolutionary point of view, and assigns to it a certain historic importance only. In course of development it must give way to another form of economy, just as the feudal economic order formerly gave place to the existing order.

"A tour of German economic life" is the description given by Dr. Müller to his book, and the survey thus made, partly owing to the admirable style of the author, undoubtedly combines instruction and interest to a remarkable degree].

✻ ORR JOHN : Grass and Hay Farming. An Economic Study. Manchester University Press, 1931, pp. 38, 4 plates, 3 diagrams.

[The object of the writer, who is Chief Agricultural Advisory Officer at Manchester University, is to stress the importance of grass as a crop in Great Britain, to indicate the needs of the soil for production of satisfactory grass crops, and to show that the investment of capital on the lines dictated by these needs is remunerative and with proper management may return a high rate of interest. It is usual to deplore the change which

has come about in Britain from arable land to permanent grass. What is to be deplored in his opinion is that the money that might be made out of grass and hay is not being made, partly from want of knowledge, but more largely from want of management and enterprise.

Good grass is recognised by all farmers to be the foundation feed of cattle from weaning till the period of fattening. The weedy and inferior condition of much of the pasture of Britain, however, renders it almost inedible, and consequently the stock or dairy farmer finds himself compelled to spend disproportionately on cake and meal.

Precise figures are supplied and illustrated by some effective graphs in regard to a farm where a change in the system of management of the grass and hay land effected a very remarkable increase in the returns over the four year period 1927-30, passing from a *loss* of 53.9 per cent. in 1927 to a *gain* of 78.6 per cent. in 1930 on the enterprise capital, *i. e.*, capital invested over and above the capital that must be engaged if the farmer is to farm at all, this latter being described by the writer as "routine capital". This striking transition from a large minus to a large plus return was due to the fact of the changed "direction" of the expenditure. In other words, instead of merely following the established custom of applying farmyard manure to the grass fields, the actual requirements of grass as a *crop* were taken into consideration, and accordingly generous applications of lime, phosphate, potash and nitro-chalk were successively made. The value of the grass rose from £1.13s per acre in 1927 to £12. 1s 7d in 1930, while the expenditure on purchased feed per cow fell from £15. 0s. 10d in 1927 to £8. 3s. 9d. in 1930, or a 45.5 per cent. reduction. The net result is, as already stated, that instead of a loss of 53.9 per cent. on the capital employed in obtaining grass, there was in 1930 a gain of 78.6 per cent. on this capital, or if the sum gained per acre by sale of the farmyard-manure thus saved, *viz.* 11s. per acre, be added, then a total gain of 86.75 per cent.

The writer goes on to point out that the treatment here described, applied to the whole area of the farm, as well as the meadows and pasture, although bold and comprehensive, does not cover all that it is possible to do in this direction. In addition to scientific manuring, improved methods would include some attempt to modify the botanical composition of the pasture by seed and the application of mechanical cultivation to grassland. The inferiority of grassland is most often due to the presence of valueless plants, which are left ungrazed by the cattle, die down and form a "mat". This mat checks the next year's growth and prevents the proper action of the soil. From the economic point of view therefore this mat wastes the farmer's money. As the writer says: "Between the capital which the farmer invests in his soil and grass, and the capital which he invests in his cattle and sheep there should be the closest and most active co-operation. The first portion of the capital cannot bear its fruit except through the second, but they never meet; the first is lost on the way to its object". However scientific may be the manuring, if the fertilisers cannot, on account of the presence of the mat, penetrate properly into the soil, the expense of fertilising is thrown away. "A survey to determine how much of the permanent grass and hay in Great Britain is grown on top of a wasteful mat would reveal a serious position".

Elimination of the "mat" can be effected by severe although not necessarily deep cultivation, followed by seeding with active and nutritive grasses and, if desired, with clover, accompanied by suitable and adequate fertilising. To complete the process of displacement of the old unprofitable pasture, grazing and mowing should be carried out in rotation, somewhat on the lines now adopted on New Zealand dairy farms with highly satisfactory results. In this way there might gradually disappear from English landscape the discouraging sight of fields stocked but not grazed, the cows either ranging the fields in search of food that is not there, or gathering at the gate waiting for the provender to be brought from the cowhouse. As Mr. Orr adds, this "makes no money".

There can be little doubt that the main agricultural wealth of Great Britain must henceforward lie mainly in live stock products. In 1925 the estimated value of the live stock, milk and dairy produce, and wool sold off farms in the United Kingdom was £182,367,500 or 63.7 per cent. of the value of the total agricultural output, and as the writer has shown in this brief but pithy monograph "the foundations for development in this direction are sure and wide"].

KLAUDER G. Dr. Grundsätze zur landwirtschaftlichen Betriebstatistik. Theodor Steinkopff, Dresden und Leipzig, 1931, Pages 86 (Beiträge zur landwirtschaftlichen Betriebswissenschaft, Heft 2).

[The writer first defines the object of statistics of farms based on accountancy data as being of value in questions alike of organisation of the farm, of the advisory service on professional matters, of scientific work and of agrarian policy.

The writer first outlines the various purposes which may be served by farming statistics based on accountancy data, showing their value for farm organisation, for the agricultural advisory service, for scientific work and for agrarian policy. He then proceeds to explain the statistical methods, analyses them on the basis of the results published by the Accountancy Offices in Germany and makes suggestions as to the choice and adaptation of statistical principles the most appropriate from the point of view of rural economy and agrarian policy. Any tying of oneself down to figures must however be avoided. For a full understanding of statistical data and capacity to use them properly a thorough knowledge is required of the natural and economic conditions in which the data have been obtained. Any mechanical application apart from a critical insight into the figures results in false conceptions and may lead to serious error.

The work includes chapters on averages, on the grouping of farms, on statistical errors, degree of intensity, delimitation of economic regions, the employment of statistical results for the objects of agrarian policy and for advisory work in agriculture. The handling of these subjects indicates the methods and the limits of elaboration and of employment of statistics based on farm accountancy data, wherein to a greater extent than in other statistics attention is paid to the comparability of the data and to the facts which they represent.

The whole work is a valuable contribution to the improvement of statistical investigations based on farm accountancy].

MARRANI (Pelio, Ingegnere industriale, Perito Commerciale. Capo dell'Ufficio tecnico della Confederazione Nazionale Sindacati Fascisti Industria) : *Organizzazione industriale*, with 138 graphs and 32 tables.

[Economic science in the 18th and 19th centuries began by investigating the principal laws that govern the capitalist economic system, and therefrom has gradually proceeded to enquire into the principles that have validity for separate economic units such as the industrial undertaking and give these their distinct form. Some hundred years after the appearance of the "Wealth of Nations", that epoch-making work was followed by Taylor's "Shop Management" and "Principles of Scientific Management". In these the author, on the basis of his own prolonged and precise observations of manufacturing processes carried out in factories, indicated the conditions of production and the methods of work calculated to render more systematic the general process of production and to increase considerably the degree of efficiency in work.

The book under review is also an exposition of these ideas in regard to rationalisation of production and organisation of industry on scientific lines, and is largely based on the views of Taylor and his school. It represents however in part an expansion of "taylorism" and in part a more complete application. A precise and logical investigation is made of all the factors, whether material or psychological, that create favourable conditions for the processes and ensure the best possible results to the manufacturer, while not involving any prejudicial effect on the permanent productive capacity of the worker. One-third of the book is devoted to descriptions of the different methods of remuneration and to discussion of the practicability of their employment as well as of the advantages and disadvantages of each in turn. Considerable space is given to industrial hygiene, the psychological reactions of the worker, selective tests of workers, measures taken to prevent workers' accidents, etc. In connection with all these subjects, the recent Italian legislation, as laid down in the *Carta del Lavoro* since April 1927, is introduced and explained. The problem of technical rationalisation thus passes beyond the narrow limits of the single undertaking and becomes an important social problem of the present time, the significance of which was not fully realised by taylorism in its original form.

The book will be welcomed by the manufacturer, and so far as the ideas it contains can be usefully applied to improved organisation of agriculture, it may be studied by the enlightened farmer also with profit].

LEPPAN Prof. Hubert D. : *Agricultural Policy in South Africa* Johannesburg, 1931, pages 101.

[This short treatise is a survey of the farming situation in South Africa and an attempt to indicate the agrarian policy which is really consonant with the geographical and climatic controls affecting the development of the sub-continent. In his earlier work "Agricultural Development of Arid and Semi-Arid Regions" published in 1928, Prof. Leppan dealt fully with the subject of these natural controls, and here only a brief

summary of the main facts is given, as regards the unreliable rainfall, high evaporation, extensive losses from erosion, formation of alkaline soils, as well the natural disability arising from the absence of inland waterways.

It is the writer's view that the instability which characterises the agricultural production of the Union and reacts on its industry and commerce is largely due to these natural causes, and in particular to the incidence of droughts. Provision against risks of this kind is a serious factor in production costs, tending to make difficult all capital investment in stock, equipments, manures, etc. As a further result of the uncertainty of outlook there are wide fluctuations in distribution and hence in prices. A sound agricultural policy should aim at stabilisation of the position. In Prof. Leppan's opinion "the present policy in the Union in fostering the production of grain for sale is basically wrong". He points out that where, as in South Africa, the influence of natural controls is erratic the live stock industries involve the least risk, the obvious reason being that animals can be moved about whereas crops cannot. Moreover, speaking generally, the natural conditions of the Union are not favourable to grain growing; more than 80 per cent. of the country can never be used except for grazing, and accordingly any stabilisation of the position depends on pasture improvement together with the production wherever possible of supplementary fodder crops. To attempt to grow cereals under irrigation in the Union is merely to aggravate the position by adding heavy charges to the costs, thus making even more impracticable the competition with the great grain growing regions of the world. On the other hand irrigation may be profitably applied, even on areas subject to frost, to produce fodder crops for *consumption on the farm* or in the immediate neighbourhood. Such crops eventually enrich the soil, whereas cereals grown for export are robber crops.

In other words the South African farmer is most likely to succeed if he aims at placing livestock products of good quality either on the markets of the industrial centres of the Union itself or on the export market, and the writer urges that all possible measures be taken to encourage such an orientation of agriculture.

In his criticism of irrigation schemes, the writer does not omit to recognise the increasing importance of citrus fruit growing under irrigation, but points out that areas put to this use are necessarily frost-free, and consequently enjoy the longer growing season which brings an advantage in production. A striking table is given showing that the value of production from irrigated land is in direct correlation with the frost-free period. Irrigation in South Africa can however never approximate to the importance it has in India or California, the extent of potentially irrigable land in the Union having been estimated by experts at not more than three million acres, probably most profitably exploited by small scale private irrigation schemes rather than by large public undertakings.

The vigorous handling in this book of the problem of agricultural policy has aroused a very general interest in South African farming circles and it is probable that it will do much to strengthen tendencies which are already making an appearance in the farming practice of the more enlightened section of the Union agriculturists].

KRISCHANOWSKI, M.: Die Planwirtschaftsarbeit in der Sowjetunion. Verlag für Literatur und Politik. Wien-Berlin, 1927. S. 124.

GRINKO, G.: Der Fünfjahrplan der Sowjetunion. Verlag für Literatur und Politik. Wien-Berlin, 1930. S. 288.

KNICKERBOCKER, H R: The Soviet Five-Year Plan, its Effect on World Trade. John Lane The Bodley Head Ltd. London 1931. Pp. 245.

[The national economy of Russia has since the beginning of the Revolution passed virtually through three important periods.

From 1917 to 1921 was the epoch of the so-called war communism. Formally speaking, the new State succeeded in getting into its own hands practically all the public organisations alike for production and for distribution of products. The actual outcome however was a disastrous shrinkage of the national resources.

It was therefore essential in 1921 to have recourse to a new economic policy (NEP) by which it was intended to leave more scope to private initiative. This new departure had had a considerable success, and there was a slow but a steady re-establishment of the national economy and of the general vital forces of the country. This progress, however, due to private initiative, was made at the expense of the communist principle.

In 1927 a new system of economic policy was inaugurated, which was intended to combine, so far as possible, the elements which in the two earlier periods had contrib-

uted substantially to the development of the socialist State : in other words the endeavour was now to combine the communist principle of the first period, *viz.*, the monopoly, by the State, of the entire economy, with the idea of economic development that characterised the second period. By this means it was hoped to give a strong impetus to the national economy, while forcing it, at the same time, along socialistic paths, and regulating and determining its working in advance, alike as regards the nature of such working and the extent. Such are the general ideas which form the basis of the Five Year Plan, and are characteristic of the whole economic life of the Russia of our own times.

The literature relating to this third period is already very extensive. The three books the titles of which appear above, two by Soviet officials, taking part in the execution of the Plan, and one by an American, illustrate this plan from different sides.

KRISCHANOWSKI, the head of the State Office for the carrying out of the Five Year Plan, gives us in his work the economic results of the ten first years of the Soviet Government (1917 to 1927). These first results represent the basis on which the economic structure of the Five Year Plan has been built up for the years 1928 to 1933. The figures of production are compared by the writer with the pre-war figures. A description is also given of the development on industry, agriculture, foreign trade, etc. It is explained that the problem of the method to be followed for the realisation of the Five Year Plan has been, ever since 1921, the subject of study by the various scientific institutions as well as of public discussion ; also that since 1923 the Five Year Plan in all the branches of industry has been subjected to a detailed analysis by the Commission for the realisation of the Plans (*Gosplan*) of the U. S. S. R.,. It was however only in 1925-26 that it proved possible to establish the first scheme of financing and of the mass production of the large and medium industries. The schemes drawn out for the execution of the Plan are not, according to KRISCHANOWSKI, abstract theories but spring from a close contact which has been maintained between the scientific work of preparation of plans, and the practical labours of a number of economists. They are accordingly, so to speak, steeped in reality and can stand the test of practical life.

All who desire to obtain in a short time a clear idea of the economic movement in Russia during the first two periods of the Russian revolution, will find in this work the official presentation of the facts and the corresponding figures.

GRINKO, at present the Commissary of the Finances of the Union, describes the genesis of the Five Year Plan and the way in which this plan takes shape in the different branches of the national economy. The final object of the Plan is to transform Russia as soon as possible so that from being an agricultural country, industrial only in the second place, it will become an industrial country in which however agriculture will retain an importance of the first order. It is anticipated also that the Five Year Plan will bring about psychological conditions by encouraging the impulse to create and by stimulating the will power of the population.

The most difficult problem presented by the Plan is the regulation of the agricultural production which extends over more than 20 million peasant farms. The author states that the collective treatment of the farms, and the social transformation of the village, are alike making rapid progress. According to the Plan, from 5 to 6 million individual farms with a cultivated area of 22 million hectares will have to be collectively organised by the end of 1933. As early as 1930 there were already some six million farms, accounting for an area of more than 30 million hectares, which were managed on a socialistic basis. The area under cultivation is to be increased by 26 per cent. in 1933 by means of bringing virgin lands under cultivation. The total production of agriculture and stock breeding will have to be increased by 55 per cent. The cereal export should in the same time increase by a total of five million *pounds*, and consequently reach some 80 per cent. of the pre-war exports. Machine production should go up from 125 million roubles in 1927 to 610 million roubles in 1932-33. Tractor factories with an annual output of 50,000 tractors per factory are also under contemplation, and in a few years it is expected that the Union will hold the first place in tractor production. It is true that for the moment it is still necessary to import many machines, raw materials and semi-manufactured products. If the Plan is not to suffer, this necessity for importation makes it absolutely necessary to increase also the exports of naphtha, timber, furs, etc., and also of food stuffs, although the interests of national consumers do not always and everywhere allow of this. To quote the writer. " The partial difficulties of the food supply are of a temporary and transitory nature ". According to the writer no one in the U. S. S. R. doubts that, in the sphere of provision of the food supply, difficult moments can be surmounted within a relatively short

time, as the result of the economic progress achieved by collectivist agriculture (p. 256). Somewhat further on, GRINKO expresses himself even more clearly and more concretely in this respect: "If in the solution of the food problem the consuming interests of the social strata which are not proletarian, and still more of those strata which are not co-operating in the Soviet society, are injured, this fact cannot harm the socialist structure of the U. S. S. R. The line dividing the proletarian class from the others is not to be altered or obscured when it is a question of solving problems of food supply in a moment when all factors seem adverse" (p. 257).

KNICKERBOCKER, who is an American, travelled through Russia as correspondent of the *New York Evening Post*, and collected information on the spot. His account of his travels resembles an instantaneous photograph but one taken in a good light. He is full of admiration for the grandiose nature of the Five Year Plan which he describes as "a grandiose scheme, the most gigantic economic project in history, the most pretentious attempt ever made to put the planning principle into effect.", etc. He illustrates the striking results obtained on the basis of figures and calculations. *Inter alia*, he speaks of the great Soviet farm "Gigant" in the Northern Caucasus, which covers 642,000 acres of land and gives employment to some 3,000 permanent workers. He also explains the necessity for Russia to export goods even, as he says, below production costs, e. g., cereals and coal. In view however of the depreciation of the Russian money, the exportation confers a certain advantage.

In general the impressions of the writer tend to show that, as the result of the Five Year Plan, the national economy of Russia is becoming more and more powerful, but that at the same time standards of living of the great mass of the population are still extremely low. The book is easy to read and well set out and the matter is both interesting and instructive].

KOLÁR DR. RUDOLF: Zemědělské pojištění u nás a v cizině (Forms of agricultural insurance in Czechoslovakia and in other countries). Czechoslovakian Academy of Agriculture, Prague, 1930, 216 pages, numerous tables and graphs. (Summary and text of tables and graphs in Czech, German and French.)

[This is a careful and well documented enquiry into a problem under discussion at the present time in Czechoslovakia: the organisation of hail insurance and of livestock insurance in accordance with the principles of public utility. Forms of such insurance have to be discovered likely to be most suitable to the conditions of the country. It is not possible to render obligatory to the same extent all kinds of insurance, in view of the different character of the risks. The insurances mentioned must be based on the principle of mutuality.

The work includes a thorough and detailed analysis of all aspects of the problem, conclusions and proposals as to the systematic organisation of insurances, and a wealth of material in regard to forms of insurance not merely in Czechoslovakia, but also in many other countries. It is accordingly a work of much originality and is of considerable interest both from the national and from the international standpoint].

Meliorační úvěr v Československé Republice (Land Improvement Credit in the Czechoslovakian Republic), Ministry of Agriculture, Prague, 1931, 33 pages. (Summary in French and in German).

[This brochure contains information of some interest on the method of financing the land improvements which have been carried out in Czechoslovakia in the period from 1919 to 1930 and on which the total expenditure amounted to 1,780 million Czech crowns. It also outlines the programme of improvement works designed to cover the next ten years which are estimated to cost three and a half milliards of Czech crowns. To meet these requirements a State Fund for land improvements has been established by the law of 27 March 1931. This organisation which is a self-governing corporate body will have the right to raise the necessary funds for long term credit. Special interest attaches to the terms of this law and to the programme of land improvement works for all persons dealing with questions of land improvements and the financing of such operations].

PUBLICATIONS OF THE AMERICAN SOCIOLOGICAL SOCIETY. — Volume XXIII. The Rural Community. The Chicago University Press, Chicago, Illinois.

[The American Sociological Society has published a highly interesting volume containing a number of studies, surveys, notes both sociological and statistical relating to the "Rural Community".

The subject matter is arranged under the following heads: Division of Human Ecology and Population, Division on Statistics, Division on Social Psychology, Division on Social Research, Section on Rural Sociology, Section on Educational Sociology, Section on the Family, Section on the Community, Section on the Sociology of Religion, Section on Sociology and Social Work.

Reports from the various Committees of the Society conclude the volume. Each division and section contains abundant material of research, and a number of statistical tables show the systematic care which has been taken by the authors of a great many of the above studies in supporting their conclusions or suggestions by ascertained facts and tabulated figures. The volume gives the impression however that a great deal of work remains yet to be done before the sociological problems affecting rural life can even be said to have been clearly defined. Sufficient statistics, even those of an official character, appear to be lacking in a number of cases or to be too recent to permit final conclusions. There is much material in this field which thus far appears to be mostly theoretical.

Some of the studies are accurate historical accounts of the trend of sociological events in rural communities which tend to show that further developments may be expected. Such problems as the interrelation between urban and rural life appear on the contrary to have been clearly defined in all their favourable and unfavourable reactions. Other subjects treated are not confined to rural conditions, but deal with sociological problems of a general character. Such are the articles on family life in America of which their authors give a rather dark picture.

On the whole this volume published by the American Sociological Society is a source of information on Rural and Urban Rural life in the United States of considerable importance].

## PUBLICATIONS RECEIVED BY THE LIBRARY

### Books.

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[Title and text in Italian and French].

ASSECURANZ-COMPASS. Internationales Jahrbuch für Versicherungswesen 1893 gegründet von G. J. Wischniowsky. 31. Jahrgang, 1931. Wien, 1931.

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## OF

# AGRICULTURAL ECONOMICS AND SOCIOLOGY

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## CO-OPERATION

### Agricultural Co-operation in Norway.

#### INTRODUCTION.

Except as regards the co-operative dairy societies there was towards the end of last century still very little development of agricultural co-operation in Norway. The very low density of the population, the geographical character of the country, with its mountains, forests and deep fjords making communication difficult, go far to account for this, especially if it is remembered that no long time ago the products of Norwegian farming were almost entirely consumed on the farm or sold on the local and district markets. Accordingly the necessity for setting up organisations for selling these products on distant markets, which has acted as one of the main encouragements for the movement of agricultural co-operation in other countries, was not felt in Norway.

In the present century, on the other hand, agricultural co-operation has made very rapid progress and at the present time, as shown in the table below, out of the 125,000 persons engaged in agriculture as a primary occupation, about 62,000 belong to central co-operative associations for purchase of farming requisites, while 44,000 are members of the co-operative dairies, about 30,000 of the co-operative slaughterhouses, and about 13,000 are members of the central egg-circles. The agricultural population is also strongly represented in the movement for consumers' co-operative societies which include in their membership about 50,000 of the farming population.

*Position at the end of 1930 of the more important Agricultural Co-operative Organisations and of Consumers' Co-operation.*

	Membership	Turnover million crowns	Net profit crowns	Funds millions crowns
Central Purchasing Associations.	62,300	35.0	1,005,900	5.4
Central Association of Consumers' Co-operative Societies in Norway (N. K. L.) . . . . .		30.6	1,200,000	6.7
Consumers' societies affiliated to N. K. L. . . . .	110,076	110.2	5,600,000	34.0
Consumers' societies independent of N. K. L. . . . .	50,000	40.0	2,000,000	8.0
Dairies . . . . .	44,000	80.0	2,000,000	15.0
Slaughterhouses . . . . .	29,865	20.5	233,600	2.5
Central egg-circles . . . . .	13,000	4.5	89,000	0.2

It should in addition be noted that during the last two or three years a very vigorous activity has been displayed in connection with agricultural co-operation resulting in the formation of several large new central organisations. Of these the Milk Centrals and the "Fleskecentralen", the general organisation of the bacon pig producers and of the co-operative slaughterhouses, include in their membership the great majority of the farmers of Norway.

#### I. — THE LEGAL SYSTEM OF THE NORWEGIAN CO-OPERATIVE ORGANISATIONS.

No special law on co-operative societies exists in Norway, but several other laws contain clauses relating to the legal constitution of co-operative enterprises. Among these are : the law of 17 March 1890 relating to trade registers and to power of attorney, the commercial law of 16 July 1907, the law of 25 July 1913 on crafts, the law of 4 April 1924 on banks, etc.

As regards registration, the co-operative societies must be registered in the Trade Register as are all other commercial enterprises. The co-operative society is registered as without liability and with a variable membership and capital. Each society is obliged to present to the Register a list of names of the members of its council of management and a copy of its rules, and to state the nature of its undertaking. All modifications of rules must also be communicated to the Trade Register. Exemption from this obligation of registration is granted only to co-operative societies which have no warehouses and distribute only goods ordered in advance by members (purchasing societies).

With the exception of the purchasing societies, every co-operative society is obliged before beginning business to take out letters of commerce, certain conditions being required for the obtaining of this. If a society desires to open more than one branch, it is obliged to take out letters of commerce and to pay an annual charge for each branch. In this case also sales can only be made to members.

A co-operative society may undertake any kind of production. If however it is desired to undertake a form of production which comes under the law on occupations or crafts — such as baking, etc., — the head of this section of its activity must possess an artisan's licence and must act on the management council of the society.

Co-operative societies are not permitted to undertake banking operations, but they have the right to accept members' deposits, to pay interest on these and to utilise them for their own business.

The societies are also debarred from undertaking insurance business, which may only be undertaken either by share companies or by mutual insurance societies. There is however nothing to prevent a co-operative society from being a shareholder in an insurance company as in any other share company.

Co-operative societies, like private traders, are not subjected to the obligation of publishing accounts or official audit.

As regards charges, co-operative societies are obliged to pay the land tax, the tax on the income yielded by property as well as the tax on the surplus coming from sales to customers who are not members. On the other hand profits on sales to members are not subjected to any tax.

#### II. — CO-OPERATIVE SUPPLY ORGANISATIONS

##### A. *Purchasing Organisations.*

The first local organisations for joint purchase of farm requisites in Norway were certain rural economy societies (*Landbruksselskaper*) which in the eighties included this activity on their programmes. A more extended purchasing organ-

isation was however not formed till 1896 when the rural economy societies of four provinces established the Central Co-operative Purchasing Association in the capital Oslo (*Faelleskjøpet i Oslo*) which grouped the local purchasing societies of the surrounding country. Some years later, towards 1900, three other similar centres were formed in other regions of Norway, and at the present time (towards the end of 1930) there are seven such centres linking 2200 local societies with about 62,000 individual members.

The societies affiliated to the Central Associations are either true purchasing societies (*innkjøpslag*) specially formed for the purpose, or agricultural societies (*landbrukslag*), small cultivators' societies (*smaabrukslag*), dairies, cheese making societies, consumers' co-operative societies, and other similar organisations.

Members of local purchasing societies are not expected to make any contribution, and as a rule they do not pay any entrance fee. The societies therefore carry on business without members' capital, but members are jointly and severally liable for payment of all goods delivered to their society by the Central Association. Any loss is distributed among the members on a pro-rata basis of the goods received during the last financial year.

All the members of a local purchasing society are obliged to purchase from the society fertilisers and concentrated stock feeds ; as regards other commodities however no obligation of the kind exists.

Goods are distributed at current prices by the purchasing societies and must be paid at latest thirty days after delivery. In the case of non-payment within this period, some societies have established the rule of making no further delivery of goods before discharge of the payment due. With a view to a more regular observance of this term of 30 days, several societies have arranged for a bank loan from the district savings bank, the members being jointly and severally liable for such loan. On receipt of the invoice for the goods, the manager of the society sends it to the bank together with a list showing the apportionment among the members. The bank then debits to the current account of each member the sum due from him, and forwards the payment to the Central Association concerned.

Purchasing societies are managed by a council of three or five members, one of whom acts as chairman. Either the chairman, or the manager engaged for the purpose and in receipt of a small salary or of a fee fixed according to the quantity of goods handled, takes the members' orders, forwards them to the Central Union, distributes the goods, receives the money and makes the payment to the Central organisation, unless the banking system described above has been adopted.

The original constitution of the central organisations of the local purchasing societies was not entirely based on co-operative principles, since as already stated these organisations were set up by the rural economy societies of the provinces, and during the early years were administered with the help of loans guaranteed by the provinces. At the present time, however, their organisation is entirely co-operative, and the reserves which they have succeeded in building up enable them to dispense with the loans guaranteed by the provinces.

Except as regards election and composition of the committee of representation and of the management council, the majority of the Central organisations are for the most part based on the same principles. An idea of their organisation and commercial methods may be gained from an account of the constitution and rules of the Central Purchasing Association at Oslo, which is the most important of these organisations.

Admission to the Central organisation is not for the local societies conditional on payment of subscriptions, but it is essential that members should be jointly and

severally liable to the Central body for all the obligations of the society, that the societies should guarantee that their membership is not below ten, and that the society and its members undertake to make all purchases of fertilisers and concentrated stock feeds from the central organisation.

Goods received must be paid for at latest 30 days after delivery, unless some other stipulation has been made. If payment is not made at the due date, no further deliveries are made to the society till the accounts are discharged. If three months after due date payment for goods has still not been made, the sum is legally recoverable. On any overdue liability, the defaulting society is obliged to pay an interest of 2 per cent. higher than the discount rate of the Bank of Norway.

If a local society desires to withdraw from the Central organisation, three months notice should be given before the expiry of the financial year.

The highest authorities of the Central Association are the Committee of representatives and the management council. The Committee of representatives consist of 45 members, 38 appointed by the affiliated purchasing societies and 7 by the seven rural economy societies in the provinces which have been absorbed by the Central organisation. One of the main functions of the Committee of representatives is to elect the management council, which consists of seven members, one for each province. The council appoints the commercial managers and the rest of the staff.

Two per cent. of the annual profit is distributed to the affiliated societies which during the past year have made their payments within the time allowed, while the remainder of the profits is employed for the constitution of a reserve fund. When the reserve fund has reached one-tenth of the average turnover of the three preceding years, a bonus may be paid to the affiliated societies.

Goods the distribution of which to the local societies is ensured by the Central Purchasing Associations include artificial fertilisers, concentrated stock feeds, seeds, flour and meal for domestic consumption, implements and machines for farm use, cement, electric equipment, fuel oil, etc. The Central Associations undertake production only to a very limited extent. Thus the Oslo Association has a mill and also a field for growing of selected cereals, the Stavanger Union has two oat grinding mills, and that of Trondhjem has a lime stone mill, and following the example of the Oslo Central Association has also a farm for the production of selected cereals.

In 1918, the Central Purchasing Unions with the assistance of the Peasant Farmers' Bank, established the Union of Central Co-operative Purchasing Association (*Samvirkecentralen*), the object being to act as intermediary in importation. This however was subsequently dissolved.

In 1930 the Central Purchasing Associations showed an aggregate turnover of 34.9 million crowns with a net profit of about one million crowns. In comparison with 1929 the turnover has decreased by 8.6 per cent., but as in the same time the drop in prices of commodities was even more, there was an increase in the quantity of commodities sold. At the present time nearly three fourths of the artificial fertilisers and the concentrated stock feeds used in Norway are supplied by the Central Purchasing Associations.

### B. Consumers' Co-operative Societies.

The movement for consumers' co-operative societies has undoubtedly not the same importance for the rural population in Norway as it has for that of the two neighbouring countries of Denmark and Finland. As however an important part of the activity of these societies takes the form of purchase of the products of rural members and sale to town members for their consumption, and as the farmers are

largely represented in the movement, it should be duly accorded its place in this account of Norwegian co-operation.

The first consumers' co-operative societies in Norway were founded during the sixties but, mainly on account of the want of competence among the founders and, the unduly large credit given to the members, the movement was not long-lived and towards 1880 the greater part of these societies disappeared. The movement was not resumed till 1895, when the Christiania Co-operative Society was organised, in full accordance with the Rochdale principles. The foundation of this society gave a new impetus to the movement, several societies were established on the same model and in 1906 a central organisation was formed, the Norwegian Co-operative Union (*Norges Kooperative Landsforening*, or simply *N. K. L.*).

At the present time there are in existence in Norway about 800 consumers' societies with a total membership of 160,000 persons, representing with the members of their families, from one-third to one-fourth of the total population of the country. At the end of the year 1930 there were affiliated to the Norwegian Co-operative Union 455 local societies with 110,000 members in all. Outside the Union about 400 local societies were also in existence with a total number of 50,000 members. Complete particulars are not available as to the activity of these non affiliated societies. Of the members of the societies affiliated, 99.2 per cent. were workers in industries including the fishing industry, seamen, transport workers or commercial employees, 26.3 per cent. were farmers, 6.2 per cent. were farm labourers, while the remainder were distributed among other callings.

All the local societies affiliated to the N. K. L. are based on the Rochdale principles. The working capital is ensured by the contributions of the members. These contributions are of two kinds: the liability contribution, or the amount which renders members jointly and severally liable for the financial obligations of the society, and the loan contribution. The amount of the liability contribution is usually from 60 to 100 crowns; the loan contribution is at least 100 crowns. In addition to the last named sum a member may however make a voluntary contribution of any sum he pleases. Contributions bear an interest of five per cent. The management council consists of from five to nine members and is elected by the general meeting of members, which meets twice in the year. Some large societies have in addition committees of representatives. No member can withdraw from the society unless his contributions are paid, and three months notice of resignation must be given in writing. The accounts are audited by auditors appointed by the general meeting. Apart from this local control, more than half the societies affiliated to the N. K. L. are at the same time members of the audit department of that Association, the accountancy experts of which check the audits and the stocks held by the societies.

The turnover of the local societies affiliated to the N. K. L. amounted in 1930 to 110 million crowns, or, on an average, 1000 crowns per member. The gross profit amounted to 16.2 million crowns and expenditure to 10.6 million, respectively 14.2 and 9.6 per cent. of the turnover. The net profit amounted to 5.6 millions, including 3.1 millions paid to the members as bonus.

The economic position of the societies affiliated to the N. K. L. may be described as very good. Their total assets amounted in 1930 to about 42 million crowns, of which 17  $\frac{1}{4}$  million represented the estimated value of the real and other property, while their capital and funds amounted to nearly 24 million crowns and the remaining liabilities to 17.4 million.

There were 121 establishments for production attached to the local societies affiliated to the N. K. L. in 1930, of which 90 were bakeries.

The object of the N.K. L., which was, as already stated, founded in 1906, is to act as a regulating influence on prices of commodities, to accumulate in its savings department consumers' money for their own advantage, to establish local societies, to diffuse a knowledge of the social and economic importance of co-operation and to safeguard the interests of consumers in regard to legal matters.

Any co-operative society which is organised in accordance with the principles of the model rules of the N. K. L., and undertakes to observe the rules of the Association, may be affiliated on payment of a sum of 10 crowns per member. Affiliated societies are liable in respect of the financial obligations of the societies only to the extent of the shares thus paid.

All sales take place at wholesale prices, and payment must be made within the 30 days following the delivery of the goods. If payment is made before the expiry of the period, advance interest is credited to the society, if on the other hand the period has expired, the society is obliged to pay interest for default. Affiliated societies are not under any obligation to make their purchases from the Association.

The general meeting of the members which takes place every three years is the supreme organ of the Association. All local societies have the right to send to this body one representative plus a certain number of additional representatives in proportion to their purchases from the N. K. L.. The congress elects the management council consisting of five members with the addition of the managing director and a member elected by the staff of the N. K. L. In the intervals between the general meetings, the highest authority of the N. K. L. is the committee of representatives, consisting of 24 members, 22 elected by the 16 District Unions of the local societies and two by the employees and officials of the Association. The committee of representatives regulates the more important questions, purchase and sale of real property, establishment of factories, etc. The committee also appoints the manager who is responsible for the commercial activity of the Association.

The advisory and propaganda activities of the N. K. L. are undertaken by the Department of organisation, and the funds required are ensured by the annual contribution of 60 öre per member, which every society is obliged to pay to the department in question. The propaganda and educational activity is carried on by the review "Kooperatören" of which 100,000 copies are printed monthly, and by lectures or vocational courses. The work of organisation is done in collaboration with the District Unions of the societies.

The N. K. L. does business in every kind of merchandise, distributing from its depots in the different towns. Agricultural products supplied by the local societies in the rural districts to the depots for forwarding to the local societies in the towns form an important proportion of these sales. The total turnover has since the foundation of the Association increased with almost no interruption and in 1930 amounted to 30.6 million crowns, a sum which in spite of the fall in the wholesale price index is nearly one and a half million crowns larger than in 1929. The net profit was 518,000 crowns.

In addition to its wholesale trading activity, the N. K. L. works two margarine factories, one tobacco factory, one soap factory, a mill, a shoe factory, three establishments for coffee-roasting. It also owns two insurance companies, one for general insurance against losses, and one for life insurance. Among the manufacturing establishments the margarine factory had in 1930 an output of 3,263 m. tons of the value of 3.7 million crowns, the turnover of the soap factory was one million crowns, that of the Stavanger mill, the capacity of which at the present time is 1500 hl. per day, amounted to 5.1 millions, and the shoe factory had an output of more than 100,000 pairs of shoes per annum, with a total gross value of 1.3 million crowns.



The activity of the savings departments which date from 1911 is carried on by the Deposits Section of the N. K. L. which at the present time has 80 branches with 18,000 depositors and deposits amounting to from 6 to 7 million crowns.

It may finally be noted that the N. K. L. is a member of the Scandinavian Co-operative Association of Wholesale Trade (*Nordisk Andelsforbund*), a purchasing organisation based on co-operative principles and grouping together the Wholesale Trade Co-operative Associations of Denmark, Norway, Sweden, and since 1928, Finland.

(to be continued).

H. LINDSTEDT.

## Regulation of Co-operation as an Economic and Social Institution in Spain.

Before 1929 no legislative measures properly so called were in existence in Spain regulating the working of the co-operative societies, and these societies were regarded as of a similar nature as the simple groupings constituted for every kind of purpose regulated by the Law of Associations of 1887 in an indefinite and general manner. On 28 January 1906 a law on agricultural syndicates was passed, the object of which was to support and encourage co-operative tendencies. It included special provisions granting facilities for the formation of and exempting from taxation co-operative societies formed under the aegis of this law on syndicates. In view of the absence of legal provision on the subject of co-operation, the Government in 1929 gave full consideration to the situation and a Royal Decree was enacted on 26 July. In virtue of the provisions of this decree, the organisation of agriculture and stock-breeding was decentralised and placed instead under the Provincial Assemblies (*Diputaciones provinciales*) to which was attached in each case a special body of an advisory and executive character for the benefit of farmers and stockbreeders organised in co-operative societies. By a later decree of 21 November of the same year 1929, regulations were enacted to which the agricultural associations and syndicates now have to conform. These included rules for the ordering, classification and supervision of co-operation in its separate activities with a view to ensuring the interests of the members and to the reinforcement and improvement of all existing co-operative effort while assisting its expansion in all possible ways.

Such were the measures relating to co-operation to be found in Spanish legislation up to the beginning of the new regime.

In view of the defective character of the legislation prior to the year 1929 and seeing that the legislation of that year did not correspond to the democratic tendencies which inspired the new situation, the Government of the Republic passed on 4 July 1931 a Decree, which was declared law on 9 September. This law was designed to meet the requirement so strongly felt in Spain for a legislation which would define and regulate co-operation as an institution of true economic and social character within the legal forms according fully with co-operative needs, so that co-operative development might proceed smoothly and without disaster.

As it rests with other publications of this Institute, and in particular with the *Annuaire International de Législation agricole*, to supply the text of laws, no details of this Law will be given here, and this account will be confined to some notes on its more striking and novel features.

New legal measures were necessary; they were demanded primarily by the backward state of the co-operative movement, and also by the vague character of the former measures which rendered nugatory all efforts for the encouragement of co-operation; and finally because under the new regime it was impossible to

retain the phrasing of certain provisions of the laws of 1929 which had been passed in a political situation characterised by tendencies completely distinct from those of the present situation.

On the other hand, on the eve of the reform which is to effect a radical transformation in Spanish land tenure, co-operation, which will have to fill an important place in the successful carrying through of the reform, must perforce be planned along the same progressive lines as the reform itself, and must in the aims it adopts correspond as a whole to the requirements which will be created by the agrarian reform in Spain.

It may first be stated what is meant by a co-operative society under this law.

The following is the definition : “ . . . the association of natural or legal persons who, placing themselves in their organisation and working under the prescriptions of the present law, keep before them as object *not that of money-making* but the satisfaction of some *common need* and the ensuring of the *social and economic welfare* of the members by means of the joint action of the members in some collective operation ”. In other words, there is here outlined the form of a co-operative society of an economic and social character, the essence of which is the satisfaction of joint requirements but without any money-making object. This does not exclude honestly earned profits but does exclude the excessive gains which should not be associated with the true co-operative system.

The legal conditions essential to all co-operative societies are as follows :

(a) complete powers of self-government, by their own statutes and the agreed decisions of the general meeting.

(b) equality of voting rights for all members. None the less certain exceptions may be established, when the rules of the society expressly admit them, as in the case of the co-operative vocational workers' societies in which some members may hold up to three votes, in accordance with the extent of their participation in the affairs of the society ; it is however understood that the capital brought in remains independent, and that the plurality of votes is not applicable to affairs of a personal character.

(c) there is no obligation in respect to the function of any particular person or body.

(d) participation in share capital is not transferable except as between members, under conditions to be fixed, and that in the event of assigning any interest to those shares in the capital it is fixed in advance at an amount which must never exceed the legal interest.

(e) that in the event of distribution of surplus the division will take place proportionately to the participation of each member in the operations of the society.

The minimum number of members is 20, except in the cases in which a different minimum is established either by law or by regulation for societies of some defined type. The maximum membership cannot be limited either by statute or *de facto*, except where there is special justification and with the previous authorisation of the Ministry of Labour.

The elimination of all idea of gain, referred to previously, is established by the law in the following terms : “ No one may belong to a co-operative society in the capacity of a society promoter, a contractor, a capitalist member or anything of the sort. There can be no preference shares, founders' shares, nor any combination that tends to ensure privileges or special advantages to certain persons, unless there is an act or agreement to the contrary ”.

The full juridical personality which is granted to co-operative societies confers upon them the right to acquire, to own, and to alienate goods and rights, to con-

tract obligations, to bring civil and criminal suits and to perform all actions calculated to fulfil their purposes or to be in defence of their interests, always in conformity with the laws and rules of their constitution.

As regards liability of members, the co-operative societies may be of three classes ; societies with limited liability, the commitments and obligations of which are limited to the assets of the society ; co-operative societies with supplementary liability, in which the members may constitute a supplementary guarantee, with a maximum fixed in advance ; and societies with unlimited liability in which the members are liable to the extent of the whole of their property. Consumers' co-operative societies may not be constituted on a basis of unlimited liability, and there is a similar prohibition as regards corporate bodies forming part of a society with unlimited liability.

In order to distinguish true co-operation from any form of association partially resembling it the law says that "... only the societies classified as such by the regulation of the present decree may employ the designation 'co-operative'. No other association, society, company or establishment may use in its designation, sub-title, advertisement, label or announcement, nor any document the word 'co-operative', nor any other of similar meaning or one likely to lead to confusion". The object of this regulation has been indicated, which is to prevent other institutions of non co-operative character obtaining the special treatment which is accorded to the true co-operative societies, or benefiting in any way by the advantages which are conceded by the law to co-operation.

A special Register is formed in which co-operative societies must be registered. No fee is required but no society may begin activities until it has been registered.

In accordance with the modern views as to the equality of the sexes before the law, it is provided that membership of a co-operative society is open, without the necessity of the consent of the husband, to any married woman who desires to belong to a co-operative society, and without delay if the society is one with limited liability ; and to any woman without the necessity for paternal consent if she has completed the age of 16 years.

Any member may resign from the co-operative society to which he belongs on giving the notice in writing which is required by the rules, provided that the extent of the notice does not exceed one month in the consumers' co-operative societies and that on withdrawal a member remains liable for discharge of his commitments and liabilities contracted at the time of his withdrawal. After the expiration of two years from the resignation no kind of liability can be required of the member who has withdrawn. When the resignation of a member is accepted his share in the society's assets is liquidated on guaranteeing the sum that corresponds to it if such share was not made subject to liquidation of non-discharged liabilities.

The law lays down that in the case in which the participation of the members in the society's capital is represented by shares, these shall be registered shares of a value not higher than one hundred pesetas each. For the formation of the fund of reserve it is enacted that 10 per cent. at least of the profits of each season shall go to constitute a reserve fund until it reaches a sum equal to the amount of the individual capital brought in on a compulsory basis by the members.

The administration of the co-operative societies is in the hands of a council consisting of five individuals as a minimum, and in the societies of more than one hundred members there will be set up, in addition to the council, a committee for the passing of accounts formed by three individuals chosen by the general meet-

ing. The above is a statement of the purport of the principal provisions of the law in respect of the working of the co-operative associations, and the classes of these societies as established by the law may now be enumerated.

Under the designation of *Consumers' Co-operative Societies* there fall in one group five different classes, viz.:

Consumers' co-operative societies	}	distributive
		special supply
		health and sanitary
		miscellaneous services
		dwelling house provision

Forming independent groups there are :

Co-operative study societies (*Cooperativas escolares*).

Workers' co-operative societies (*Cooperativas de trabajadores*).

Vocational workers' co-operative societies (*Cooperativas profesionales*).

Co-operative credit societies (*Cooperativas de crédito*) and Co-operative insurance societies (*Cooperativas de seguros*).

The characteristics of each of these groups may be briefly summarised.

In the societies included in the group of consumers' co-operative societies, the condition necessary for those of the first category, the distributive societies, is that the excess returns, after the requirements of the reserve fund and of the operations of the society have been met, are distributed proportionally to the amount paid in full by the members in payment for goods or services rendered to them severally by the society. The societies for distribution and sale may render services to the members of another similar society on a reciprocal basis, and to corporations and also to the general public, for reasons of public utility or when the competent authority so directs.

The same rules obtain for the co-operative societies of the second class of this group, those of special supply, or the societies engaging in the supply of water, gas, electricity, machinery, fertilisers, etc.

As a feature of the co-operative sanitary societies proving their non-individualistic character and their practical aim, the provisions of the law may be quoted prescribing that no interest is payable on the share capital and that all gains, after due regard to the reserve fund has been had, are devoted to improvement of the services and the operations of the society. This class of co-operative society may receive aid or subsidy from co-operative societies of other kinds when required by the objects of its activity, and there is no obligation as to reciprocity of services.

Co-operative study societies (*cooperativas escolares*) are societies formed among the students of centres of instruction for the purpose of inculcating the idea of co-operation. They are of a strictly popular character, their object being the wider diffusion of co-operation and its practice.

By workers' co-operative societies (*cooperativas de trabajadores*) are understood by the law those the main object of which is the improvement of the return from and the conditions of the personal labour of their members by the following means : contracting for the joint labour of all members or groups of members, joint execution of work, joint purchase and distribution to members of the materials and implements of their labour, co-operative management of land and of production centres. The necessary condition of the workers' co-operative societies is that, in the event of distribution of the surplus returns, after due regard has been had to the reserve fund and the operations of the society, the division should be made in

proportion to the value assigned to the personal labour contributed by each member to the common work. No person other than a member may be permanently employed by these societies ; at the busy times, however, such as seed time and harvest in farm work, or when manipulation of a product has to be accomplished within a definite time, non-member workers may be taken on. When these societies reach the point of having liquid social assets in excess of ten thousand pesetas per member they will lose their character of workers' co-operative societies, and will pass, for all legal purposes, to the group of vocational workers' co-operative societies (*cooperativas de profesionales*).

The law regards as vocational workers' co-operative societies (*cooperativas de profesionales*) those formed by farmers, stockbreeders, manufacturers, etc., with the object of carrying out jointly and on co-operative bases certain operations designed for the improvement of the enterprise from the economic standpoint, for example : purchase or production or distribution among the members of requisites, raw materials and implements, and of all the means of production, such as machines, fertilisers, seeds, etc. ; joint performance of the preliminary operations of production, or inversely joint execution of the final transformation processes of the products of members up to the point of final preparation for the market ; joint practice of some industry, more particularly the industries complementary or subsidiary to those practised by members ; joint farming of lands or management of industries of members, thus forming an enterprise of higher order by the co-operative union of different particular enterprises ; sale of the products of the society and of the members ; facilitating the obtaining of the credit required for the operations of the society by means of pledge or mutual security ; and finally carrying out every kind of operation directed towards the greater economic welfare of the society. The profits shown by the annual statements of these co-operative societies of vocational workers are distributed among the members according to the total amount representing the operations performed by each member with the society.

The regulations for the working of the co-operative credit societies authorise impositions, advances, loans and discounts, recoveries of payments and payments on account for the members, performance of necessary banking services and of every other operation complementary to those mentioned. These co-operative societies may grant credits only to individuals or bodies holding the status of members. The interest of all operations is fixed at the most strictly economic limit, in no case exceeding the legal limit. Within these regulations the co-operative credit societies will endeavour to give their activities an eminently popular character with the object of diffusing credit facilities as widely as possible and bringing the benefits within the reach of the poorest worker.

The constitution of co-operative insurance societies (*cooperativas de seguros*) is authorised by the law. An initial guarantee fund is to be formed, with contributions apart from the subscriptions and premiums, and with the support also of persons and bodies not insured. External contributions will not however confer any right to exert influence on the development of the society, but are merely a method of guaranteeing the working of the society at the first stage. The law provides that subsequently these external contributions to the society shall be replaced, within a suitable period, by the funds of the societies themselves. The activity covers all forms of insurance, mainly those most necessary to the working classes, such as accident, maternity, unemployment insurances.

After providing for ranging in the groups indicated all forms of co-operative activity, the law proceeds to regulate the dissolution and liquidation of associations, and with due regard to the democratic principles and to the principles of social

equality which throughout inspire the law, it is provided that in no case would there be appropriated to any member, in the event of the dissolution of the society reimbursing him, a higher value than that which would be paid to him if he had left the society at any time of his own accord ; also that the amounts derived from the obligatory reserve funds cannot be distributed, in any case, between the members, and that these sums as well as those which represent the excess of the value corresponding to the payments to the members, already mentioned will be devoted to the co-operative work of instruction or of benevolence as the general meeting of the society in liquidation may decide. All amounts which for any reason are at the disposal of the co-operative society at the time of its dissolution will be devoted to similar purposes.

It is open to co-operative societies to forms Unions and Federations, and to make agreements for the accomplishment of operations of common interest.

A Centre is established under the Ministry of Labour, the function of which is the study, proposal, execution and diffusion of legal measures relating to co-operation, investigation of the co-operative movement, encouragement of its development in Spain, inspection of the societies and such supervision as is necessary. This Centre will be an informative organisation to the Government as regards the co-operative societies and will act as intermediary.

With respect to the advantages and facilities conceded to the co-operative societies, representation is secured to the consumers' societies in the official organisations for provisioning and they are authorised to supply their members directly with articles of prime necessity, independently of any provisioning agreement which the authorities may have with other suppliers. The different groups enjoy exemption from a number of taxes. Workers' co-operative societies may tender for public works, and will have preferential treatment as compared with other competitors. The guarantees they have to give as security on their farming and other enterprises are reduced to the fourth part of that which is required of other undertakings which are not co-operative in character.

In conclusion, with a view to preventing other societies of miscellaneous type from sheltering under the protection accorded by this law to co-operative societies, and securing the advantages without fulfilling the eminently democratic purpose which runs all through the new legislation on co-operation, any attempt of this kind will be punished by the infliction of a fine of 1000 pesetas on co-operative societies which infringe the provisions of this law, and of one of fifty pesetas on the members of the administration. In the case of repetition of the offence the sum will be doubled.

All the already existing societies, in order to function as such, will be expected to accept the provisions of the law and to introduce into their rules the modifications that will be necessary for the fulfilment of the mandate.

E. M. B.

## INSURANCE

### Hail and Livestock Insurance in Switzerland (1).

Hail insurance is of relatively old standing in Switzerland : its first appearance dates from more than a century ago. Although preceded by some quite temporary and limited experiments the formation of the Mutual Insurance Society founded at

(1) The following note is chiefly based on the data and material communicated by the Division of Agriculture of the Federal Department of Public Economy in reply to the questionnaires addressed to it by the Bureau of Economic and Social Studies of this Institute.

Berne in 1825 may be considered as the first attempt to organise effort to meet the disastrous losses caused by hail. The activity of this society was soon extended to several cantons, but in consequence of certain occurrences the detail of which is only imperfectly known (including secession on the part of the farmers of the Cantons of Vaud, Fribourg and Lucerne), this society disappeared in 1860.

In the cantons of Fribourg and Lucerne, two societies were in 1831 and 1836 formed the first of which survived about 50 years and the other rather more than 20 years ; there is no information available on the activity of the society established in the Canton of Vaud. For many years hail insurance was largely operated by foreign enterprises.

In 1875 the " Paragrêle " was founded at Neuchâtel, a mutual hail insurance association the action of which has always been confined to the vineyards situated in the territory of the Canton of Neuchâtel. In 1880 the *Société Suisse d'assurance contre la grêle* was founded at Zurich, and is the only large society in Switzerland for this branch of insurance. With the entrance of the farmers of the Canton of Ticino in 1920 into this Society, its field of activity became extended to the territory of the whole Confederation. The two societies are without share capital but have a reserve fund which is increased by the addition of the yearly balances. These reserves amounted in 1929 to 319,500 and in 1930 to 336,000 Swiss francs for the former society, the " Paragrêle " ; and to 6,597,849 Swiss francs in 1929 and to 5,906,012.14 in 1930 for the *Société Suisse*.

The Canton of Vaud on the other hand with the object of widening the field for hail insurance established under a law of 25 October 1928 cantonal insurance against damage from hail, under the name of *Assurance grêle cantonale*. The financial organisation of this institution is intended to ensure as far as possible the payment of compensation to the policy holders out of its own resources. It has a reserve fund and a scheme under which rebates are given.

Hail insurance in the Canton of Vaud is partially compulsory. Actually among the five types of premium that may be taken out under the cantonal hail insurance scheme only two are obligatory: the fixed or basic premium on vine growing (grapes and young plantations of not more than three years) and the basic premium on cereals ; while the additional premium on vine growing (grapes, nurseries of rooted plants, grafted stocks and stocks) as well as the additional premium on cereals and the insurance on other crops are all optional.

Hail insurance as well as other branches of insurance in Switzerland is subject to the provisions of the federal law on the insurance contract of 2 April 1908. This law is not applicable to reinsurance contracts, nor to contracts made by associations the sphere of activity of which is locally restricted.

The working of private insurance enterprises is subject to the Federal supervision assigned to the Confederation by art. 34, paragraph 2 of the Federal Constitution and exercised by the Federal Council in virtue of and in accordance with the provisions of the law of 25 June 1885. This law is not applicable to the local associations indicated above.

The private undertakings subjected in the law relating to supervision are expected, *inter alia*, according to the Federal law of 4 February 1919, to place a guarantee with the Federal Council.

Encouragement to hail insurance in Switzerland takes the form of both cantonal and federal subsidies. The great devastation wrought by hail in Switzerland has made it necessary for the public authorities to give financial assistance ; otherwise the societies would have been under the disadvantage of being compelled to maintain the premiums at a high level with the result that farmers would remain

aloof. The *Société Suisse* of Zurich, in view of its character as a public utility institution, received a federal subvention of 500 francs for foundation expenses. This society opened under great difficulties in years when losses were very severe and as early as 1882 the directors addressed a request to the Government with a view to obtaining a federal subsidy towards the formation of a reserve fund. This request and others that followed were refused. Finally by Message of 23 November 1888, the Federal Council proposed to the Chambers to enter on the annual budget an item for "financial assistance to hail insurance". This proposal was adopted and in the course of the discussion on the budget of 1890, a credit of 50,000 francs was for the first time granted in favour of hail insurance. This credit was continued during the years 1890 till 1893.

The Federal Law of 22 December 1893 relating to the encouragement of agriculture by the Government, a law which is still in force with certain amendments which are not of relevance here, contains an article 13 in virtue of which "the Confederation is expected to support by means of subsidies the efforts of the Cantons in regard to livestock and hail insurance". The sums assigned each year by the Federal Government on behalf of hail insurance are given to the societies in the form of subsidies facilitating such insurance :

- (a) by paying the cost of the insurance policy ;
- (b) by making a contribution to the payment of premiums ;
- (c) by constituting a reserve fund.

In accordance with the law quoted, the Government subsidy in favour of these two types of insurance must never exceed the sum set aside for the same purpose by the canton.

These subsidies were paid in full up to 1914. After and including 1915, owing to financial difficulties, the Federal Council decided that the subsidy could no longer exceed :

- (a) for insurance policies: 50 per cent. of the expenditure,
- (b) for the premiums : 20 per cent. of the expenses in the case of insurance of vineyards and 12.5 per cent. if the insurance applied to other farm crops, cereals vegetables, fruits, etc.

The total amount of the cantonal subsidies is fixed by the respective legislations of the cantons. Inhabitants of the two cantons of Glarus and Grisons receive no subsidies in aid of hail insurance. The Canton of Ticino, where the *Société Suisse* refused up to 1920 to arrange policies on account of the high risks and of the absence of adequate statistical data on the frequency of hail storms, enjoys higher Federal subventions in certain classes of risks, under the condition that a subsidy at least as high is given by the canton. As regards the canton of Vaud, the State is under an engagement, for the years in which the total of the premiums and the funds available from the reserves of the *Assurance grêle cantonale* are not sufficient to meet the full payment of the compensation assigned to members, to advance to the bank of the institution in question the sums required to make up the difference. These advances must be repaid to the Bank of the State at the earliest possible date with a normal interest. The total of unrepaid advances must not exceed 5,000,000 francs. The State liability for the engagements which may accrue to it in this connection is thus expressly limited, apart from the contributions from the policy-holders, to the sum above indicated, in accordance with the provisions of art. 22 of the same law. In the event of the surplus reserve funds, sums accruing from any reinsurance that may have been effected, and the State guarantee of 5,000,000 fr. being all exhausted, the Council of State may decide on reductions in compensation.



On 16 March 1928 a recommendation was laid before the Federal Chambers which a few months ago had still not been discussed. It runs as follows: "the Federal Council is invited to present a report as regards the desirability or otherwise of encouraging the introduction of compulsory insurance against hail for certain crops by means of the modification of the conditions to which the Federal subvention intended for this form of insurance is subjected".

Switzerland possesses a regular service for the ascertainment and reporting of the occurrence of hailstorms: this service is provided through the Swiss Central Meteorological Station at Zurich which is an official institution. Reports are received from high altitude stations and also from correspondents who give their voluntary services in many districts. Information on the date, place and severity of hailstorms supplied to the central station enable it to publish each year a complete survey of the subject.

The purely scientific side of the work lies with the Central Station: the direct practical ascertainment of facts (kind of crops damaged by hail, identification of the areas under each of these crops, and estimation of the losses in each case) is undertaken by the hail insurance organisations, as it is clearly in their interest to obtain exact information on these points.

The development of hail insurance in Switzerland has been almost continuous.

Years	Number of policies	Assured capital
1890-95 (yearly average) . . . . .	23,349	21,876,606.59
1906-10 " " . . . . .	58,041	61,058,549.60
1914 . . . . .	66,661	81,356,404 —
1918 . . . . .	88,739	206,476,184 —
1924 . . . . .	84,302	170,489,460 —
1929 . . . . .	100,941	181,650,105 —
1930 . . . . .	115,126	186,842,015 —

In spite of the diminution in the value of the currency, the figures just given prove that the idea of hail insurance has made great progress in Switzerland and that the insured capital is greatly in excess, from the absolute point of view, of the pre-war amount.

On the other hand the course of business was not very successful; during the years 1924 to 1929 premiums were far from sufficient to meet the indemnity payments. The unappropriated reserves were placed under heavy contribution to make it possible to compensate the losses.

The business done in hail insurance in Switzerland during the years 1924 to 1929 may be shown in the of form percentages of the sums assured, taken from the Report of the Federal Bureau of Insurances published in 1931 and relating to the financial year 1929:—

Years	Gross premiums	Gross compensation payments	
	in percentages of the sums assured	in percentages of the sums assured	in % of the premiums paid
1925 . . . . .	2.01	1.82	91.0
1926 . . . . .	2.15	1.19	56.0
1927 . . . . .	2.06	4.27	207.0
1928 . . . . .	2.34	2.94	127.0
1929 . . . . .	2.41	2.61	108.0

As regards the encouragement given by the public authorities to hail insurance, the following are the figures published by the Federal Council in its report on the activities of 1930 and relating to 1929 and 1930 :

	Policies	Assured capital	Premiums	Expenditure of the Canton			Federal subsidies
				Cost of policies	Premiums	Total	
1930 . . .	115,126	186,842,015 —	4,771,909.80	70,378 15	708,287.08	778,665.23	765,780 60
1929 . . .	110,941	181,650,105.45	4,737,699.45	66,646.51	688,080.75	754,727.26	748,207.40

The aggregate total of the premiums received according to the reports of the institutions for 1930 (including the cantonal and federal subsidies) amounted to :

For the <i>Paragrêle</i> . . . . .	francs	80,700.50
For the <i>Société Suisse</i> . . . . .	»	3,448,452.40
For the Canton of Vaud . . . . .	»	1,250,955.90
Total francs . . . . .		4,780,108.80

The total amount representing compensation payments made was in 1930 :

For the <i>Paragrêle</i> . . . . .	francs	89,748.10
For the <i>Société Suisse</i> . . . . .	»	3,752,851.90
For the Canton of Vaud . . . . .	»	702,978.20
	francs	4,545,578.20

The *Société Suisse* of Zurich is the only one of the Swiss institutions covering hail risks which is re-insured. This Society is re-insured in virtue of a reinsurance agreement on the basis of partial reinsurance and of excess loss with the following societies : the *Compagnie Suisse de réassurance* at Zurich, "*La Suisse*", *Compagnie Anonyme d'assurances générales* at Zurich, the *Société Suisse d'assurance contre les accidents* at Winterthur, and "*La Générale*", *Société anonyme d'assurances* at Berne. The *Société Suisse* has paid in 1930 a total sum of 1,419,242 francs in reinsurance premiums : the reinsurances have yielded in the course of the same year a total sum of 1,497,289 francs on a total of losses amounting to 3,752,851 francs.

The *Assurance-grêle cantonale* of Vaud has been in negotiation for three years with different companies, but no one of these has so far undertaken to reinsure its liabilities. The *Paragrêle* does not reinsure its risks.

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Livestock insurance has been practised in Switzerland over a long period. The local private associations, of a mutual and optional character, were the first to give farmers the opportunity of obtaining insurance against mortality of livestock resulting from disease or accident. These communal or intercommunal associations form even at the present time the backbone of the system.

The cantonal and Federal authorities at an early stage gave considerable attention to the fostering of the movement. In the cantons laws were put into force which have tended to make live stock insurance compulsory in the respective areas. These laws contain provisions relating to the subsidising of the local associations; such subventions vary with the cantons and are calculated on different bases: number of head of stock insured, estimated value, amount representing losses, etc. The laws also fix the principles on which the rules are to be established, including questions of organisation, compensation in the event of death of the animals, contributions of the insured owners, expiry of the claim to compensation, etc. A certain number cantons have not yet made insurance compulsory (Schwys, Unterwald, St. Gall, Lucerne, Zug, Appenzell); in others the obligation exists only for certain parts of the territory, the communes or groups of communes only in which a certain proportion of the owners of live stock have declared themselves in favour of insurance. In short there is much divergence in this respect.

Live stock insurance is thus carried on in Switzerland almost exclusively by the local organisations which do not come under the federal supervision of insurance societies.

There are no large societies in Switzerland for insurance of live stock. In 1920 there were in Switzerland 2,101 local live stock insurance societies distributed as follows: 1,919 cattle insurance societies with 128,000 members, 45 societies for insurance of horses with 17,000 members, 127 societies for insurance of goats with 4,400 members and 10 pig insurance societies with 700 members (1).

The last report of the Federal Bureau of Insurances, published in 1931 and relating to the financial year 1929, mentions three societies only as operating in this branch of insurance and subject to Federal supervision: the *Mutuelle chevaline Suisse* founded in 1901 at Lausanne (sums assured, fr. 6,775,095, premiums, 262,146, losses 202,203); the society for insurance of horses and live stock founded at Berne in 1925 (premiums, fr. 40,591, losses, 26,452) and the General Insurance at Berne which undertakes this type of insurance only so far as relates to slaughter stock.

There is no reinsurance federation in Switzerland relating to live stock.

In accordance with the provisions of art. 13 of the Federal Law already mentioned of 22 December 1893 relating to the improvement of agriculture, the Federal authorities assign to the cantons in which compulsory insurance of live stock is instituted either for the whole territory or for certain parts of the canton, subsidies which are a first charge on the credits allocated for the purpose on the budget of the year. As stated before in connection with hail insurance, the Government subsidy must never exceed the amount set apart for the same purpose by the canton.

The total amount of the Government subsidies is fixed as from and including 1930 by the decree of 5 November 1929. This decree establishes that the annual subsidies of the Confederation will amount to the same figure as the cantonal subsidies, but for cattle they are not to exceed francs 1.50 for each animal registered in the insurance association.

For animals registered in an insurance association of the mountainous regions and for those registered in another association but having passed the summer on a

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(1) The number of co-operative live stock insurance societies subsidised by the Federal Government was in 1930: 1662 cattle insurance societies, 131 societies insuring at one and the same time large and small live stock, and 31 societies insuring only goats. In these figures there are not included, the data relating to two cantons, nor the societies for insurance of horses, as these are not subsidised by the Federal Government.

mountain pasture, a supplement will be granted the amount of which may reach francs 0.75. For the small live stock, sheep, goats, pigs, the annual subsidies from the Federal Government are not to exceed francs 0.60 for each animal insured. In 1929 the federal subsidies were calculated on the basis of the former decree of 6 March 1921 (francs 1.25 and 1.75 for cattle and francs 0.50 for small live stock). The same law provides that for the fixing of the Federal subsidy account shall be taken of the number of animals insured at a given date, usually at the beginning of the financial year of the insurance association. The cantons, by agreement with the Division of Agriculture of the Federal Department of Public Economy, fix the date for the count of the animals for insurance.

There is a special law in existence in Switzerland dated 13 June 1917 containing a number of measures to be taken for control of epizootic diseases. It contains among others the following provisions which may be noted here: owners of animals that have died or been slaughtered in consequence of rinderpest, contagious peripneumonia, glanders, rabies, anthrax or symptomatic anthrax, are not compensated by local associations, but directly by the cantons and the Federal Government. The same procedure as to compensation applies in the case of owners of healthy animals slaughtered with a view to the prevention of the spread of the disease in question.

Compensation is equally given whether the animals die of any of the diseases indicated or whether they have to be killed subsequently to the employment of prophylactic measures, *e. g.*, preventive vaccination, as ordered by the authorities.

By the terms of the same law the indemnity assigned by the cantons must be calculated in such a way that, taking into account any proceeds of the sale of the utilisable parts, the owners of the animals are compensated in the cases mentioned to the extent of from 70 per cent. to 90 per cent. as the case may be of the estimated value of the animals that have died or been slaughtered.

The Federal Government assigns to the cantons subsidies of from 40 to 50 per cent. of the expenses incurred in connection with the carrying out of the measures prescribed as above.

The following table is taken from the Report of the Federal Council on its working in 1930 which gives a summary for 1928 and 1929 as regards the number of animal insured, of losses, of compensation payments made, as well as the total amount of the subsidies conceded by the public authorities.

	Number of insured animals	Number of losses	Compensation payments made		Cantonal subsidy		Federal subsidy
			total sum	per head of stock died or killed	total sum	per head of stock	
Large stock . . .	842,499	28,394	5,924,201.88	209	1,460,878.03	—	1,084,976.18
Small stock . . .	35,497	2,149	81,828.93	38	23,546.90	—	17,748.50
1929 . . . . .	877,996	30,503	6,006,030.81	—	1,404,424.93	—	1,102,724.6
1928 . . . . .	894,846	31,852	5,883,781.80	—	1,494,898.62	—	1,116,566.48

In the 17 cantons where live stock insurance is obligatory, the owners are mainly insured with the local associations. There is not much business done by insurance societies under Federal supervision, as appears from the following figures:

	Premiums	Compensation payment
1925 . . . . .	331,041	212,727
1926 . . . . .	346,130	228,264
1927 . . . . .	354,406	253,846
1928 . . . . .	373,438	276,026
1929 . . . . .	324,190	241,109

For the financial year 1929 there is even a falling off. According to the Report of the Federal Bureau of Insurances the reduction in the total of the premiums is solely due to a particular kind of insurance, the insurance of slaughter stock, which had acquired a certain importance on the Basle market. It appears that the interests taken in this type of insurance has diminished. The premiums banked for the insurance of slaughter stock in 1928 amount to 89,410 francs ; for the year 1929 the total amount was not more than 21,353 francs.

## BIBLIOGRAPHY ON ECONOMIC AND SOCIAL QUESTIONS

BAUER-MENGELBERG (Dr. Käthe), Privatdozent an der Handelshochschule Mannheim, Professor am staatl. Berufspädagogischen Institut Frankfurt a/M. : "Agrarpolitik in Theorie, Geschichte und aktueller Problematik". Verlag und Druck von B. G. Teubner, Leipzig und Berlin 1931. Seiten 248.

[It is symptomatic for German post-war agriculture that so many books have appeared dealing with agrarian policy as main topic. During the last decade scarcely a year has passed in which some new work on agrarian policy or a new edition of some former work has not been registered. In this connection there need only be mentioned the works dealing with this subject by AEREBOE, BRENTANO (2nd edition), FUCHS, SCHULLERN-SCHRATTERHOFEN, SKALWEIT, WYGODZINSKI (2nd and 3rd editions). Among these are works planned on a large scale which cover the entire field of the theory and practice of agrarian policy. There are in addition works which discuss isolated problems of agrarian policy, and emanate from such distinguished writers on the subject as SERING who treats the questions of home colonisation, the trade in cereals, RITTER dealing with tariffs on cereals, BECKMANN with the problem of credit, and so on. An increasing interest, however, attaches to the economic aspect of agriculture, because in contrast to the pre-war time the phenomena of agrarian policy now display a certain discontinuity, and accordingly some elucidation of each period, however short, in the course of the history of agriculture seems to be demanded.

The recently published work of BAUER-MENGELBERG may be ranked among those indicated above. Taking fully into account the most recent developments in agricultural economy, an attempt is made by the writer to describe the fundamental principle and present day problems of agriculture. The book falls into three main sections. In the first the economic theory of agricultural production is discussed ; the natural bases of production, the different systems of crop rotation, the varying size categories of farms, in connection with which it is justly remarked that it is possible to speak of an "optimal" size category only in completely defined economic and social conditions. A fairly detailed investigation is made of the pre-requisites and results of intensive cultivation, in connection with the law of rising costs, marketing possibilities and prices of land ; and much that is valuable is added in regard to the adaptation of agricultural production to the market fluctuations.

The second part is devoted to questions of the history of land tenure. The gradual evolution of the early constitution of land tenure in Germany from the manorial system of the Middle Ages, through the emancipation of the peasants, to the formation of the *Reutengüter* or farms held on payment of an amortisation rent, is traced, in order to describe in closer detail the land settlement policy in New Germany.

The present day problems of German agrarian policy are handled in the third part. In the first place the importance of agriculture for German economy as a whole is indicated, and a number of arguments are brought to show that under a distribution of

work on the basis of a scientific world economy wherein each type of production is assigned to the locality indicated by natural and economic conditions, the tendency of the post-war period to self-sufficiency, to supply of needs by each from his own plot, can be justified only in quite exceptional cases. The problem of agricultural labour is handled from the legal and economic as well as the social standpoint, credit relations are investigated, the price scissors problem is analysed, the expediency of land taxes is discussed, and so on.

The standpoint adopted by the author is that in modern economic life wherein the chief aim is to arrive at the highest possible earning capacity, and the principal means thereto is rationalisation carried to the furthest possible point, agriculture, the purposes of which are inherently different, seems to be on another plane. The farmers' aims are in fact frequently quite apart from economic interest; in the case of large farms, economic considerations are forced into the background by other points of view, questions of power, of influence, etc. In the opinion of the writer the economic motive has also little weight with the small or family farmer. In agreement with the Russian investigators of this question, and especially with Prof. A. TCHAJANOW, he declares that the small farmer is in no way "homo economicus", but that he merely endeavours to manage his farm primarily in accordance with the dictates of necessity, to meet the requirements of his own family.

This opinion cannot however command complete adherence, seeing that the war and the post-war agrarian transformations have undoubtedly completely shaken the traditional legal and social position of the owner of the large estate, so that property from being a title to possession only has become a means of livelihood, while on the other hand for the class of small farmers the market and prices of products have become all important factors in their outlook.

Elsewhere also it is difficult to be in entire agreement with the conclusions of the writer. He is however undoubtedly to be regarded as in the right in advocating for the maintenance of German agriculture such measures of agrarian policy as are calculated to place agricultural production on a more scientific foundation, and to treat the farm not as a sentimental but as an economic unit which must therefore be constituted in accordance with the logic of economy.

The book which is in convenient form makes a distinct contribution to the better understanding of more than one present day problem of agrarian policy].

HUBBACK, J. A., M. A. (Cantab.), I. C. S. : *Indian Banking, with special reference to Bihar and Orissa*. Patna University Banaili Readership Lectures 1930-31. Published by Patna University, Patna, 1931.

This series of six lectures gives an illuminating account of credit needs and facilities in India, and more particularly in the Province of Bihar and Orissa, whose conditions are most intimately known to the lecturer from his past work and his recent experience as chairman of the Provincial Banking Inquiry Committee which made an exhaustive investigation of the subject in 1930.

In the first lecture an effective outline is given of the organisation of credit in India generally, which consists of two distinct, and to a large extent heterogeneous, elements, namely the Western banking apparatus, on the one hand, and the native bankers, known as *shroffs*, as well as common money-lenders, on the other. The first of these two groups comprises the Imperial Bank, the Exchange Banks, of which the principal business is in connection with the financing of foreign trade, the Joint-Stock Banks and lastly, the Co-operative Banks. The main business of the *shroffs*, as an indigenous banking agency, is that of financing internal trade and filling the gaps in the supply of credit to the native population which are left by the more formal organisation of the banks of Western type. These organised credit agencies, Western and native, are estimated to provide between them for approximately 5/8ths of the total demand of credit in India, the balance being supplied by money-lenders working on their own capital. These fall into several groups, from the more substantial rural *mahajan* or *sahukar*, whose custom is mostly confined to landowners and cultivators, through the smaller village shopkeeper or *bania*, down to the nondescript professional or occasional lender, who thus finds a way of profitably investing any spare cash he may have. In the sphere of purely commercial credit, the commission agent (*arhatia*) and native broker (*dalal*) also play a considerable part.

The conclusions drawn from the survey of credit conditions in India are that the existing banking organisation is still inadequate to the demands made on it, and that organised banking plays an important part only in purely commercial credit. The

*shroffs* still supply a large part of the credit facilities, though their share in the business is declining. In the rural districts, organised banking is represented only by co-operative institutions, and the population depends on private money-lenders for accommodation. Indigenous banking is out of touch with the organised credit apparatus and is but slightly connected with the business of rural money-lending, though it plays an important part in rural trade. The remittance business is, on the whole, fairly well organised, but its costs could be reduced considerably.

The next two lectures deal respectively with the Credit Needs and the Credit Supplies of Bihar and Orissa, about which one learns much that is interesting. Characteristic is the high proportion which unproductive borrowing bears to the total estimated needs of credit of the population; also the fact that "interest rates tend, like many other things in India, to be customary and not economic". The principal problems of rural credit organisation, are "first to reduce the rate of interest, second to remove the dead weight of existing debt, and third to link rural credit in with the general credit system". The Provincial Committee gave considerable attention to the question of working the rural money-lender into the organised credit system, but had to content themselves with suggesting registration as a compromise.

With regard to the Co-operative Banks, the prospects of which are dealt with in the fourth lecture, the view is expressed that "the most important recommendation is that short term and long term business in the central banks should be rigidly separated", as otherwise the continuous increase in their long term loans tends to lock up too much of their working capital. The most unsatisfactory feature of the present position in this respect is that this long term business arises not out of the provision of genuine long term accommodation, but out of the indefinite renewal of relatively short-term loans by the revision of *kists* or dates of maturity. What the Lecturer calls by the name of "side shows", or the excessive development of lines of business outside the scope of purely banking activities, is another feature of the present position he strongly condemns. Co-operative banking is also advised — and with reason — to fight shy of the encumbered and improvident landlord, whom to save is beyond its power, but who may prove very dangerous for the financial standing of credit co-operation.

The success of credit co-operation depends, in the first instance, on its ability to educate the borrower in the use of credit facilities; secondly, it must satisfy demands quickly, avoiding red tape, or otherwise be defeated in its struggle with the usurious money-lender; finally, it must concentrate its energies and resources in its legitimate field of work, without engaging in side-shows.

Lecture V deals with Commercial, Industrial and Consumers' Credit, for the development of which it is suggested that the old Indian credit document, *muddat hundi* or accommodation bill, should be allowed a reduction in the stamp duty, which at present weighs on it very heavily to its disadvantage, and that the liabilities arising out of it should be defined by law, instead of by custom, as they now are. In order better to organise the resources of the Indian money market, the *shroffs* should be brought into closer association with Western banks: a step which would necessitate "on the part of the former the lifting of the *purdah* which at present conceals their business from their associates in the world of credit".

The last lecture, dealing with the principles on which the control of the credit system by Central Banks is organised in various countries, contains suggestions concerning their eventual application to India.

The book under review possesses the merit of condensing much material in the space and presenting it in an attractive form, and may be recommended to those interested in Indian economics.

The Routine and Seasonal Work of Nebraska Farm Women by RUTH CLARK and RETA GRAY — University of Nebraska.

This interesting study on the conditions of the Nebraska Farm Women is the result of a painstaking survey conducted by the authors in 1927-28 and is based on carefully checked data obtained from 179 Nebraska Farm Women. After furnishing a detailed account of the home activities of the women questioned, the study takes up the problem of the woman's contribution to the work on the farm. The conclusion reached by the authors is that Nebraska farm housewives are, on the whole, overworked. Road improvements however and modern machinery are tending to ameliorate their conditions, but there is much yet to be done in this respect, and a good deal of drudgery can be avoided by generalising the adoption of labour saving devices.

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### CO-OPERATION

#### Agricultural Co-operation in Norway (*concluded*).

#### III. — ORGANISATIONS FOR PRODUCTION AND SALE.

##### A. *Co-operation in the Dairy Industry.*

As already indicated, milk, butter and cheese are the agricultural products the sale of which was first organised in Norway on a co-operative basis. Thus the first co-operative dairy was founded about 1855 and in the following years a large number were formed in different parts of the country. Towards 1900, according to the official statistics there were from 800 to 900 dairies for butter making, cheese-making, sale of milk, milk receiving depots and condensed milk factories, the greater number of which were co-operative in character. By 1920, in consequence of amalgamation and difficulties during the period from 1915 to 1920, the number had fallen to 552, afterwards again increasing. In 1929, the year to which the latest statistical data of the industry refer, the total number was 650 (1). Nearly all the dairy societies are organised on a co-operative basis working on the following bases:

The members of a co-operative dairy undertake, usually for a period of five years, to deliver the whole of their milk production to the dairy, except the quantity used in the household and for the rearing of young animals.

The necessary capital is met by the payment of contributions of 50 crowns per cow raised on the farm. The rule is that a part only of the capital is paid in cash. For the remainder the members supply guarantees which the society may place in a bank as security for the loans. As regards the financial obligations of the dairy society, individual members are only responsible in the proportion of their shares.

The greater number of co-operative dairies under their rules prohibit members from transferring shares to another person without permission of the management, and so as to make sure that they are retained in the producers' hands many societies have further arranged that in cases of sale, decease etc., the shares should

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(1) The distribution of the dairies according to the kind of production was as follows: 74 dairies for sale of milk, 196 milk receiving depots, 62 dairies for butter making, 41 mountain dairies (*sætermeierier*), 23 dairies for combined manufacture of butter and cheese, 13 dairies for the manufacture of old types of cheese (*Gammelosthyserier*), 18 dairies for the manufacture of soft cheeses, 39 for the manufacture of cheese with sour whey, 180 dairies of mixed production and four condensed milk factories. For assignment to one of the groups mentioned, at least 90 per cent. of the milk received at the dairy must be utilised for the production characteristic of the group in question. Where this is not the case, dairies are placed in the group of 'mixed production', a group which has been increasing during the last few years from the fact that there is a growing complexity in the production of very many dairies.

go with the farm. The societies are directed by an administrative council consisting of from three to five members, elected by the General Meeting, the supreme authority of the undertaking.

The majority of the societies make payments on the basis of weight and butter fat content and in general the suppliers receive payment once a month reckoned on a lower price than the quotations at the moment of delivery, while the surplus is distributed at the end of the year proportionately to the quantity of milk sold.

About one-third of the total production of milk in Norway — which is estimated at 12 million kgs. per year — is handled by the dairy societies, while as regards the other two-thirds, one-third is consumed in the households of the producers or utilised for live stock feeding, and the other is sold by the producers themselves for direct consumption or under the form of butter or cheese.

According to the statistics given by the Central Bureau of Statistics for the dairy industry of Norway, the quantity of milk received at the dairies amounted in 1929 to 408.9 million kgs., 4.9 million of which was goats' milk. Except for the quantity utilised for the manufacture of condensed milk, 26.5 per cent. of the whole milk handled by the dairies was in 1929 utilised for butter-making, while 24.6 per cent. was transformed into soft cheese and half of it (48.9 per cent.) sold as milk for consumption.

As regards capacity, there is a clearly marked tendency towards the formation of larger undertakings. In 1929 out of 650 dairies, 121 handled from 500,000 to 1,000,000 kgs. of milk per year, 52 from one to two million kgs., while 44 handled more than two million. During the last few years an increase has been noted also in the group of the smaller dairy societies, *i. e.*, those handling less than 100,000 kgs. per year. This is explained by the increase in the number of mountain dairy societies (*setermeierier*) which all belong to this size group.

In 1929 the dairy societies paid to their suppliers 69.3 million crowns or 17 öre per kg. of milk. During the previous years the price steadily fell, the average price in 1925 being 30.7 öre, 21.2 öre in 1926, 18.5 öre in 1927 and 18.3 öre in 1928. The average working costs of all the dairy societies of Norway (with the exception of the condensed milk factories which have not supplied data) was 4 öre per kg. of milk received at the societies' premises. However, as might be expected, the prices paid to the suppliers and the costs of working varied somewhat considerably according to the district and type of production. The following table gives particulars of these variations and at the same time supplies details on the factors entering into working costs. Not all the societies are covered by the table, but merely those which from this point of view have supplied complete figures to the Statistical Bureau.

Detailed information is not available in regard to the economic position of the co-operative dairy societies; on the whole however it may be reckoned to be good, as a large number of societies are working on their own capital.

*The Export Association of Norwegian Dairy Societies (Norske meieriers eksportlag).* — As long as the sale of products of the Norwegian dairy industry was conducted almost exclusively on the local and regional markets — as was the case a short time ago — the conditions were relatively favourable. When however in the last few years the production of milk began to increase and the home market could no longer absorb all, the price of butter and cheese, owing to competition between the societies, sometimes fell below the world market level; and this in spite of the somewhat high import duty placed on these products and of the fact that their production was only a very little in excess of home requirements. The export of dairy products was in too many hands, and the want of a central organisation

*Prices paid to Suppliers and Costs of Working in 1929 for the Dairy Societies with differing types of Production.*

	Milk handled per society 1,000 kg.	Price paid to suppliers ore per kg.	Cost of working (öre per kg.)				
			Wages	Lighting, heating and power	Taxes, interest and insurances	Other	Total
Societies for sale of milk . . . . .	614	18.18	1.15	0.30	0.33	1.35	3.13
Milk receiving depots. . . . .	543	15.39	0.51	0.18	0.15	1.34	2.18
Buttermaking dairies. . . . .	191	9.69	0.50	0.24	0.11	0.80	1.65
Mountain dairies. . . . .	30	19.73	1.70	0.95	0.56	1.30	4.51
Societies for manufacturing soft cheese	260	12.30	1.63	0.97	0.99	1.32	4.91
Societies making cheese from sour whey	645	14.87	1.07	0.84	0.45	1.09	3.45
Societies combining the manufacture of butter and cheese . . . . .	447	12.68	1.36	0.72	0.99	1.58	4.65
Societies for manufacture of old type cheese . . . . .	404	15.77	0.93	0.40	0.28	1.12	2.73

which would be in a position to effect concentration was increasingly felt. Finally in 1928 the efforts for the realisation of this scheme were successful, and the Export Association of Norwegian Dairy Societies was founded.

The purpose of the Export Association, the headquarters of which is at Oslo, is to encourage butter and cheese production, to export the surplus of these products and to regulate their sale on the home market, so as to prevent their price in the country itself falling below world market prices. The affiliated societies must undertake to deliver to the Association the whole of their production of butter and cheese, except the quantities which they sell in their own shops, or, without intermediaries, to retailers. Contributions are made in 30 crown shares, one for each 100,000 litres milk received by the societies, and one for every 100,000 litres transformed into butter and cheese.

Arrangements are made by the Association with a convenient number of societies for producing and delivering quantities of butter and cheese for export with the object of keeping the home prices at a reasonable level. Any losses in the working of the Association are divided between the member societies in proportion to the quantities of milk handled during the last financial year, without taking account of the manner of utilisation.

The majority of the large societies, handling about 220 million kg. of milk in 1930 or more than half the milk handled in all the Norwegian dairy societies, are members of the Association, the activity of which has been up to the present very satisfactory.

It works in close connection with the National Norwegian Federation of milk producers, to be mentioned later. This collaboration between the two great organisations will undoubtedly give the Export Association in the near future a still greater importance by transforming it into a Central Export Union for all the Norwegian dairy societies.

*The Central Dairy Unions.* — By the formation of the Export Association of Norwegian Dairy Societies a great step forward was made in the stabilisation of prices of butter and cheese, but it was scarcely to be expected — although hopes were entertained on the fluid milk market — that the activity of this organisation in itself would in the long run prevent the price of milk as milk, or fluid milk, from falling below the level of the price paid for milk intended for transformation into butter or cheese, a fall which must mean serious difficulties for the producers.

It was only the supplementary price paid after the war for milk to be consumed as milk, that made it possible for producers to meet the reduction of prices on the market of milk intended to be otherwise utilised. In 1929 a veritable "milk war" broke out in a number of localities between the dairy societies of long standing in the towns and the suppliers from distant districts who owing to improved communications could now place their milk on the more remunerative fluid milk market. It soon became clear that the position of the producers could only be saved by the formation of a strong organisation grouping practically all the milk producers in the country, and by the payment to distant suppliers of an indemnity designed to keep them away from the large fluid milk markets. A Committee was formed to enquire into the matter, and in the following year 1930 found it possible to submit a scheme of organisation. The main lines of this organisation which is now functioning and has already proved of great benefit to the producers may be stated as follows.

The whole of Norway is divided into seven zones determined by natural boundaries, each with a Central Dairying Union which all suppliers of milk to societies, retailers and consumers are invited to join as members. The dairies, co-operative and private alike, may be attached also but not as members. In accordance with the plan of organisation no Central Union could begin to function unless 80 per cent. at least of all the milk produced in the district were assured to it, a condition which was fulfilled within a short time in all the seven districts.

The different Central Unions vary in importance, the largest handling 250,000,000 kgs. of milk per year, the smallest 10,000,000 kgs. only, but they are all founded on the same principles although differing somewhat on matters of detail.

The members of a Central Union who sell their milk directly to consumers are expected to pay over to the Union two öre on each litre of milk sold, the total sum being paid in the form of an annual contribution per cow, varying between 12 and 15 crowns according to the intensity of milk production in the different districts. Members in this class undertake to maintain a certain minimum price for their milk. According to the agreement with the Union any milk not sold for direct consumption may be sold by these members at a certain fixed price to certain dairies for the manufacture of butter or cheese.

Members supplying milk to retailers and to shops pay to the Central Unions a contribution, usually reckoned at two öre per litre, but in certain districts at three to four öre. The contribution is paid to collectors or into a bank. These suppliers are obliged to ask the same retail price as the dairy societies and to accept only milk coming from producers affiliated to the Central Union.

The two classes of suppliers mentioned account for about ten per cent. only of all the fluid milk sold by members of the Unions, 90 per cent. of which goes to the dairy societies. As already stated the main purpose of the scheme was to induce the societies in the more distant areas to give up any attempt to compete on the larger fluid milk markets. This problem has been solved in a slightly different way in the different districts, but the general principle has everywhere been to make a levy on the sale of fluid milk and thus form a fund from which compensation may be paid for milk used in the manufacture of butter and cheese. Any particular society has thus to pay a fee or levy to the Central Union or has to receive an indemnity, according as the quantity of fluid milk sold by it is large or small.

Although the Central Unions formally assume the position of sellers of all the milk of the member societies, only the balances in adjustment pass through their accounting offices, and as the greater part of the societies undertake both the pro-

duction of butter and cheese and the sale of fluid milk, these balances are relatively small and usually amount only to from five to ten per cent. of the total value of the sale of fluid milk. The remainder is retained by the societies for payment of the producers.

The adjustments are made on the basis of reports of delivery to the Central Unions which are sent in by the societies immediately on the close of each month. These contain particulars as to the quantity of milk received at the society, as well as on the quantities used for manufacture of butter and milk and sold as fluid milk. It was clear from the beginning that the success of the scheme would depend in great measure on the accurate and rapid discharge of this obligation to supply reports, and accordingly it was noted with satisfaction that, in respect of the first month, the number of reports received five days after the end of the month was sufficiently large to make it possible to calculate the balances.

As already stated the producers have already reaped great benefit from the activity of the Central Unions. Thus in the Östlandet district, the first in which a Central Union was formed, the price of fluid milk has been successfully maintained at the same level during the period for which the Union has been functioning, that is for nearly a year, and this in spite of the simultaneous fall by 5 öre per litre of the price of milk intended for the manufacture of butter and cheese. Such a stabilisation would naturally be impossible if the field were left free, when it is obvious that the cheap milk intended for transformation would invade the fluid milk market and ruin it. It should be added that the price stabilisation has not in any way brought about a decrease in milk consumption, which was feared in certain quarters. In fact the contrary has occurred, and milk consumption has increased during the time following the beginning of the activity of this Union.

A fact worth mention is that the costs of administration of the Central Unions are relatively small. In the Östlandet Central Union, for example, which groups nearly 96 per cent. of all the milk producers of the district, these costs amounted for the first financial year to 0.06 öre only per litre of milk handled.

Several forms of State assistance have been given to the active organisation of the milk trade, including the authorisation by a law passed in June 1931 of the Unions to request producers, who are not members, to pay a contribution in respect of milk sold corresponding to that paid by members. This measure will naturally greatly strengthen the position of the Central Unions.

*The Norwegian Federation of Milk Producers (Norske Melkeprodusenters Landsforbund).* — In the month of August 1931 the seven Central Dairying Unions became grouped in a common organisation, the Norwegian Federation of Milk Producers. This is a reconstruction of a formerly existing organisation of co-operative dairies and dairying associations which gave special attention to improvement of the production of societies, to price quotations, etc.

In order to cover the expenses of the Federation, the members pay a contribution of 40 öre for every 1000 kg. of milk sold during the previous financial year, and undertake in addition to take a share in payment of the costs of the Export Association, and to prevent any competition between the dairy societies of a Union and those in the area of another Union, except by permission of the Federation. As regards contributions to the payment of the expenses of the Federation and the Export Association, it should be noted that these will not be required so long as the State imposes the milk sales tax (1).

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(1) With the object of encouraging the co-operative sale of milk, cheese, butter and bacon, the Norwegian Parliament adopted in June 1930 a law by which a Marketing Council was established, and

The governing bodies of the Federation are the general meeting, the committee of representatives and the Management Council. The general meeting consists of members of the Committee of representatives and of the Management Council as well as of delegates of sub-sections. Members of the Federation who sell less than five million kg. of milk elect one delegate, those who sell more than 10 million kg. two delegates, and members selling more elect one more delegate for every 10 million kg. sold. Every member taking part in the general meeting has one vote. The general meeting appoints the Management Council and the Committee of representatives, regulates production and prices and undertakes other important business. In the Committee of representatives, consisting of 15 members with the same number of proxy members, each Central Union affiliated to the Federation has at least one representative. The duties of the Committee include the preparation of questions for submission to the general meeting and to supervise the carrying into effect of the decisions taken by the meeting.

The Management Council of three members and the same number of proxies form, together with three representatives of the Export Association of Norwegian Dairy Societies, the Central Board of the dairying industry (*Meierbrugets Centralstyre*), the function of which is to represent the Norwegian dairying industry in relation to other countries.

#### B. Co-operative Slaughterhouses and their Central Organisations.

The first co-operative slaughterhouse was founded in Norway in 1899, but owing to the inexperience of its founders and to the fact that production was insufficient to support the enterprise, its activity came to an end after two years, and it was only some ten years later (in 1910) that the first co-operative slaughterhouse to have a successful working was established and is still in existence. Apart from this one, there are at present eight others in Norway, all based on the same principles as that of Oslo, and also a private undertaking at Hammar which was founded in 1904 but later underwent up to a certain point modifications inspired by co-operative principles.

The members of a co-operative slaughterhouse must undertake to deliver to it over a period of five years the whole of their production of slaughter cattle. Sale to consumers in the neighbourhood and in the neighbouring town is however permitted. On entry, the members pay a contribution to the working funds of from three to five crowns per unit of cattle (*storfa*) raised on the farm, and undertake a guarantee of a sum of from 10 to 20 crowns per similar unit. The guarantee may be deposited in a bank as security for loans. Other necessary funds are provided by the society itself paying in one per cent. on the turnover to the working capital. Payment for the animals is effected on the basis of the price quotations of the society, quality being taken into account. The Board of Management of the society is elected by the Committee of representatives, which is chosen by the members and by district, the number of representatives being proportionate to the sum guaranteed by each district. The larger number of the slaughterhouses also engage

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in order to finance its activities imposed from 1 March 1931 and for the duration of one year a tax of 0.2 öre per kg. of all milk delivered to a dairy society, cheese-making society, condensed milk factory or other enterprise selling milk or dairy products. A similar tax was also introduced later on pig carcasses passing the official inspection of meat, and one on milk sold directly by the producer to the consumer.



in the transformation of the meat, as for example, salting, smoking, preparation of pork products and of preserved meats.

As already shown in the Introduction, the membership of these slaughterhouse societies was 30,000 in 1930 while the turnover amounted to 20.5 million crowns, as compared with 19.2 in 1929, and the net profit amounted to 234,000 crowns and the paid up capital and funds to 2.5 million crowns.

The co-operative slaughterhouse societies have been grouped into a central organisation known as the *National Federation of Norwegian Slaughterhouse Societies* (*Norske slagteriers landslag*) founded in 1930, the purpose of which is to encourage collaboration between the different societies and to protect their interests. The societies are also members of the *Norwegian Central Union for Porkmeat* (*Norges Fleskecentral*) established in 1931. This is a national organisation with membership open alike to slaughterhouse societies and to private producers. The function of this Union is to stimulate pork production and consumption, and to regulate the home market by means of export and of preservation of production surpluses, thus preventing the fall of the prices on the home markets below the level of the world market.

The members of the Central Union at present numbering about 90,000 undertake to deliver to it all porkers and all pork meat intended for export or sale at Oslo, which is the principal local market, half the pork sold in Norway being sent to the capital for sale. In respect of operations of transformation and sale on markets other than Oslo, members, whether societies or individual producers, remain quite free. Provision is made in the constitution for the possibility that the production of any kind of meat other than pork may assume in the near future such an importance that it would be necessary to export in order to maintain prices at a reasonable level; in such a case members would be obliged to deliver the corresponding items of live animals and killed meat intended for export or sale at Oslo.

Individual members pay an entrance fee calculated at the rate of 50 öre per 4 year old pig of their raising, taking the average over the last few years. This contribution may be paid by means of deductions made on the amounts due on deliveries. Members must bind themselves for a period of five years beginning from 1 January 1932. After such period they may withdraw from the Union by giving six months notice in advance. Payment for deliveries which is made in accordance with rules established by the management is calculated on a free at Oslo basis, and settlement takes place as soon as possible after delivery. Once a week at least the management establishes price quotations based on the minimum prices.

The supreme authority in the Central Union is the general meeting, the members of which are elected by area, one for a certain number of members of the Union. The assembly appoints the management of the Union which consists of seven members, an executive of three members being appointed from among these. This Committee by consent of the management takes the responsibility for the daily working. An Inspection Committee is also elected by the general meeting, and supervises the carrying into effect of the measures resolved and also deals with members' complaints.

### C. Co-operative Egg Marketing.

The first attempts at co-operative marketing of eggs were made about 35 years ago, the earliest egg collecting circle being formed in 1896. Progress was however slow and at the time of the outbreak of war, forty egg circles only had been formed.

A certain number of these were wrecked by the war partly owing to the exceptionally difficult marketing conditions, partly to the rationing of livestock feeds.

Some years after the end of the war however there was a marked revival of the movement and at the present time there are 440 local egg collecting circles in existence in Norway with a total membership of 13,000 persons. The local circles are grouped into eight Central associations covering large districts, and these are again combined into the Norwegian Federation of Egg-collecting Associations (*Norske Eggcentraler*) the object of which is to act as wholesale agent for members as regards sale of eggs in Oslo and for export.

Admission to membership of egg collecting circles is conditional on payment of an entrance fee of 5 crowns to the working fund, the taking up of a fifteen crowns share in the Circle, and the acceptance of joint and several liability as guarantee for a sum corresponding to the total capital of the Circle. Members must in addition undertake to remain in the society for at least five years and during the period of membership to consign all fresh eggs produced on their farms except those reserved for household consumption and for hatching.

They must also undertake to collect the eggs from the nests once or twice a day according to the season and to send them twice a week to the Circle of which they are members. Members delivering eggs that are not fresh are fined. Eggs are marked by the members, with the mark of the Central association concerned, the number of the Circle and the member's own number.

The local Circles make payments to members twice a month out of the amount received by the Central associations for eggs consigned, less a certain deduction to cover expenses. Eggs are bought by the Circles by weight. At the end of each year, the net profit is distributed among the members proportionately to the sums paid for eggs consigned.

The supreme authority of the egg-collecting circles is the general meeting which meets once a year and elects the management Council consisting of three members. This council appoints the manager and performs all functions which do not devolve upon the general meeting.

For affiliation to a Central association, the rules of a Circle must include: the joint and several liability of the members, the engagement for delivery of eggs and the undertaking to supply only eggs that come from the members' own farms. The Circles undertake not to withdraw from the Central association before the expiry of five years, after which time the engagement is renewed from one year to another.

Circles are expected to take up with their respective Central associations one fifteen crown share for each of their individual members and to remit to the Central association a guarantee making all the members of the Circle jointly and severally liable to the association for a sum equivalent to the total of the capital of the Circle. The deed of guarantee may be used as a pledge for loans.

The supreme authority of a Central association is the Committee of representatives, and the Circle has the right to send one delegate for each 25 members to the meeting of this Committee. No Circle is however authorised to send more than three delegates. The management Council consists of five members and is appointed by the Committee of representatives.

In the same way as the individual members must undertake to deliver all their eggs to the local Circle, so the Circles must undertake by contract to deliver all eggs produced by their members to the Central association. Circles not conforming to this undertaking are excluded and lose their shares. Payment is made to Circles for eggs by weight, and once a month after consignment.

The National Federation of Central Associations (*Norske Eggcentraler*) is a

limited liability company and the affiliated Central associations subscribe each one share of 100 crowns per every 100,000 crowns worth of eggs sold in Oslo or exported during the previous year. The Central Associations are also expected to sign a five year undertaking obliging them to sell through the Federation all eggs intended for export or for sale in Oslo, and to conform to certain rules relating to conservation, refrigeration, packing and sending, etc. If withdrawal at the end of the five years is intended, six months notice must be given; subsequently withdrawal may take place at the end of any year if six months notice in writing has been given. The breaking of contract by affiliated Central associations may involve forced withdrawal, and the loss of shares and other rights.

By the terms of the contract with the Federation, the Central Associations are expected to sell eggs only in their own district. All Central associations requiring to buy eggs to meet local needs must do so through the Federation which obtains the quantities required from another association which has a surplus. Eggs delivered to the Federation are paid at the average price obtained during the week of sale less a deduction to cover expenses. The surplus profits remaining at the end of the year after payments to the reserve fund are distributed between the affiliated Central associations proportionately to the eggs sold by the Federation.

The supreme authority of the Federation is the Committee of Representatives which is elected each year by the Central associations, each one of which sends one representative for each 250 crowns' worth of eggs, or portion thereof, sold through the Federation. The Committee of Representatives appoints the Council of management which consists of three members, decides how the surplus is to be used, appoints an auditor of accounts, and votes on any proposed modification of the rules. The Management Council elects the manager, makes rules for delivery, reception and packing of eggs, publishes price quotations, etc.

Out of the total Norwegian production of eggs in 1930 which is estimated at about 18,000 tons, from 11 to 12 metric tons have been sold and the remainder kept by the producers for household use. The export has been small, not more than from six to seven hundred tons. Out of the quantity sold, in 1930, it is true, only from 25 to 30 per cent. are accounted for by the co-operative system, the actual figure being 2,800 tons, but in spite of that, the influence of the co-operative movement is none the less considerable. It must be remembered that in the first place a large proportion of eggs sold pass directly from producer to consumer on the small local markets and hence do not enter into trade in the strict sense, and on the other hand that co-operative undertakings occupy a leading place in the supply of the more important consuming centres such as Oslo where nearly half the eggs sold come through the *Norske Eggcentraler*. As a result of the activity of this organisation, the prices reached in 1930 were on the average much higher than those of the world market, while in 1924, for example, when production and export stood at the same level as in 1930 and organisation was imperfect, the price level of eggs was much below that of the world market.

#### D. Other Co-operative Organisations of Production and Sale.

Of less importance in comparison with those already mentioned are the other co-operative organisations in Norwegian agriculture, including societies for the sale of fruit, vegetables, berries, honey and wool, etc. Co-operative societies for the sale of berries make a special object of encouraging exportation and in particular that of bilberries of different kinds and of black currants. The local "berry socie-

ties", to which belong both growers of berries and persons undertaking the gathering of wild berries, are organised in district associations which in 1930 formed a national union known as *Norges bærslag*. The object of this is to encourage proper picking, grading and handling of the berries, as well as to foster collaboration, to prevent competition and to initiate enquiries as to market conditions. On the other hand this Union does not interfere with business matters which are left to the district associations.

In this report some mention should be made of the co-operative societies for joint sale of agricultural products of all kinds. These are the four *salgslag* which are not specialised for any one product, but undertake to market all the agricultural products of their members. The products most usually so undertaken are bacon, eggs, potatoes, vegetables, etc. No complete particulars are available in regard to membership, turnover, etc. of these societies.

Although not belonging, strictly speaking, to the class of produce selling organisations, the local timber-felling syndicates should receive mention, in view of the importance of forestry as a source of revenue for Norwegian agriculture. These are grouped into large selling societies, in their turn grouped in 1929 in the Union of Norwegian Dealers in rough and worked timber (*Norges lønner-och skurlastselgeres forening*). Fifty per cent. about of the owners of Norwegian forests are thus, as members of the local societies, enrolled in the National Union.

#### IV. — CO-OPERATIVE AGRICULTURAL CREDIT.

The official institutions of agricultural mortgage credit in Norway are the Mortgage Bank of the Kingdom of Italy, the Norwegian Bank of agricultural property and workers' housing and the Norwegian Bank of small holding and rural housing. Since 1915 an important source of agricultural mortgage credit has been also an institution of co-operative character, the Norwegian Mortgage Credit Association for agriculture and forestry (*Norges Kreditforening for land- og skogbruk*) organised on the example of the *Landschaften* associations in Germany.

Satisfactory provision, on the other hand, has been made for credit for working capital by numerous local savings banks and the savings banks of the Central Purchasing Associations. This explains the complete absence of a real co-operative movement for agricultural credit in Norway, on the model of the Schulze-Delitzsch banks and the Raiffeisen societies of other countries.

Although organised as a limited company, some mention should be made here of the Peasants' Bank (*Bøndernes Bank*), founded in 1918, the object of which is to serve as a central credit institution for co-operative undertakings and for savings banks. The bank has a paid up capital of 10.5 million crowns, distributed in series of 500 crowns, and a guarantee capital of 5 millions. The series may be subscribed by co-operative undertakings, savings banks and by Norwegian citizens. Certain co-operative principles are observed for the distribution of profits.

H. LINDSTEDT.

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## LAND SYSTEMS

### Land Tenure Problems in East Africa.

It is an accepted principle that the disposal of land is always of fundamental importance in any form of society, but land policy must have a special significance in territories where as in many parts of Africa, backward native races live side by side with immigrant communities many centuries in advance in civilisation and in material resources. So far a common policy in this respect has not been reached by the administrations of the different African territories in which Europeans have decided to make their permanent home, but there is a general feeling among those competent to judge that great advantage would accrue from joint consideration of the problems relating to land tenure in such territories with a view to securing co-operation in ideas and a more or less uniform policy. In particular this view was put forward at the Pan-African Agricultural and Veterinary Conference, held in Pretoria in August, 1929, by Mr. R. H. THORNTON, Director of Agriculture in the Department of Native Affairs of South Africa. Although the discussion turned rather on questions of improvement of native agriculture and the agricultural training of natives than on the fundamental question of land tenure, the resolution adopted was one recommending to the Governments of all the States represented at the Conference the advisability of arranging for triennial conferences between officials engaged on native agricultural development, and stressing certain important principles of native land tenure.

It may be stated at the outset that, for reasons that will be later indicated, the general policy of agricultural segregation, as opposed to any system of native share-tenants, is approved : in other words, that of native owned lands apart from the European owned lands on which latter, of course, natives may be employed as wage-earners.

This being granted, two outstanding considerations should be kept in view in dealing with the question of native land rights ; these have been described re-

spectively as the "protective" and the "constructive" need. By the protective need is meant the fixing of the areas to be set aside for natives and the provision for due preservation of their rights, so far as they are beneficial, over such areas. By the constructive need is meant the provision for so dealing with the actual use of the land as to secure therefrom the greatest benefit to the natives themselves.

Apart from questions of justice and moral obligation to subject races, it is obviously essential to have full regard to the "protective" principle, if discontent on the part of the native population, with consequent prejudicial reaction on the Europeans, is to be avoided. As regards the "constructive" need, it is only necessary to refer to the wastage consequent on the so-called "fugitive" or shifting cultivation practised by natives, and to the disastrous erosion which results from their habit of grazing excessive numbers of live stock. In both cases the consequence are highly disadvantageous alike for the native and for the European population, and the tendencies should be combatted by all the forces of education.

It is of course impossible to discuss within the limits of a single article the general question of native rights in land in Africa, or even in one territory, in view of the immense variety and complexity of the primitive systems of land tenure in existence. All that is proposed here is to examine for the Native Reserves of one province of Kenya the conditions governing tribal rights as well as the customary rights of occupancy or user in land by an individual member of the tribe or smaller unit, and to show how these conditions are or may be affected by administrative action. The account that follows is mainly a summary of the material contained in the Report of the Committee on Native Land Tenure in Kikuyu Province in the Colony and Protectorate of Kenya, dated November 1929 (1).

It is a principle that must be accepted by administrators that any development of native systems of land tenure should be preceded by the most careful study of the native customs and usages, and it was with this object that the Committee in question was appointed.

Kikuyu Province is formed of the highland area (from 6000 to 8000 feet) (1,830 to 2,440 m.) lying immediately north of Nairobi and extending to Mt. Kenya. So far as its history can be traced it appears probable that before the incoming of the Kikuyu tribe the country was uninhabited forest or at most very sparsely inhabited by hunting tribes. The Kikuyu people seem to have entered from the East or North not as a tribe but as individual families of the nine main clans whose holdings are now to be found scattered over the three Kikuyu Districts, *viz.*, Fort Hall, Nyeri and Kiambu. Hunting claims were staked out over an ever widening area by these families, apparently without much regard to the territorial unity of the clan. The accepted unit of land tenure in Kikuyu province, the "*Githaka*" (plural *Ithaka*), accordingly corresponds to the original use of an area of bushland usually for hunting but sometimes in virtue of first clearing, with a continuous tradition of use extending to the present day. Owing to the native secretiveness in regard to boundaries, the average area of these *Ithaka* is a matter of conjecture; they may vary from 50 to 6000 acres (20 to 2430 ha.) and the average may be from 200 to 300 acres (80 to 120 ha.).

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(1) The terms of reference of this Committee were as follows: "A Committee to investigate the system or systems of Native Land Tenure within the Native Reserves of the Kikuyu Province and to make recommendations as to what rules should be enacted to govern the occupation rights of tribes, clans, families or individuals in each or any area, due regard being had to Native Law and Custom".

In spite of their scattered nature, the *Ithaka* almost certainly were originally under clan control. There exist now however very marked differences in this respect between the districts of the province. In the more remote districts any member of the clan can use any vacant land belonging to the clan ; in Fort Hall such rights tend to be confined to the *Mbari*, i. e., groups of families, and in Kiambu (the most southerly district) to smaller groups, such as a man and his family together with his brothers and their families. It is generally understood that the right of use means the right to cultivate, such right tending to lapse if the occupier allows the land to revert to its wild state.

An important feature for the comprehension of the working of the whole system is the existence of the *Muramati* (Administrator), or responsible person living on the *Githaka*, usually the eldest son of the senior branch of the *Mbari* settled there. Even in districts where the whole body of the Elders of the clan still have control, the *Muramati* gives the first decisions on land disputes. The influence of the *Muramati* is most marked however in Northern Kikuyu where subdivision of land is thereby prevented, whereas in Kiambu the "share-owner" becomes the important figure.

This principle of family or clan control of the *Githaka* exists side by side with the right of user or usufruct which may be distributed to sons in inheritance. This usufruct naturally tends to develop into private ownership, as the population grows in density, while the principle of family or clan control tends to restrict the rights of the individual. As remarked in the Report, these two principles "are opposites which have come together into an equilibrium, which appears capable of indefinite continuance in the atmosphere of tribalism which is congenial to it, but which reveals its instability when new factors are introduced". It is in the introduction of these new factors that the crux of the situation lies.

Before discussing the effect of new conditions including those that result from European immigration, certain existing features remain to be noticed, and in the first place a modification found in the Kiambu District of the prevailing tribal theory. In that district, which is the part of the province lying nearest to Nairobi, the possibility of a sale outright of a *Githaka* or part of a *Githaka* is admitted. This has been ascribed to imitation of European custom and such may partly be the case, but it is undoubtedly also in part the result of a tradition of some interest according to which the Kikuyu of Kiambu claim to have obtained their land originally by *purchase* from an earlier tribe, the *Dorobo*. This tradition is deeply rooted and is reflected in certain very elaborate customs and ceremonies that must accompany any case of sale of land in Kiambu to-day between Kikuyu and Kikuyu, such as the planting of certain boundary marks and the handing over of certain ceremonial gifts. In connection with this definite departure from tribal theory, it may be noted that in this District the *Muramati* becomes practically independent of the clan control, while, speaking generally, a certain progress in the direction of the small holding under family ownership may be observed.

Another important modification of the strict tribal theory is to be found in the practice by which the individual occupier may admit "tenants", whose position is more or less secure, since any such arrangement between Kikuyu rests essentially on a basis of friendship. Cultivation rights on *Ithaka* of other family groups may, for example, be temporarily acquired in return for a loan of cattle or goats, redeemable by return of the stock with or without the natural increase. Again cultivation rights may be obtained for the asking, on a basis of friendship or relationship and mutual convenience, or sometimes on the basis of adoption into

the clan or Mbari. In the Kiambu District the "loan" becomes the price of an outright irredeemable purchase, and hence tenancy on a loan basis disappears, while the cases of *Ahoi*, or tenants on a friendly basis, are much more frequent. The fact is that the large number of Ithaka alienated to Europeans before the Reserve boundaries were fixed left very many Kikuyu natives landless. A man in such a position will try to make friends with a man who has land rights, takes him a present and asks for a plot to cultivate which is practically never refused. In the Kiambu District also the claim of a landless man on his immediate relations-in-law is recognised, and if there is any available space for cultivation rights it would be contrary to all moral feeling to refuse him.

Although the ownership of the land in Kikuyu may be regarded as vested in the clan, or with the more immediate authority, the Muramati, the foundation of the claim is right of use inherited from an ancestor. Hence for practical purposes the true owner may be taken as the individual heir who may be called a "share-owner". His right is limited (a) by the fact that he has only part interest in the reserve area of uncultivated land to which other members of the Mbari have also rights, and (b) by the extent to which his right of use differs from exclusive use. In the more remote districts many rights are still communal, whereas in Kiambu, exclusive or prior rights are claimed over wild trees, sand, red ochre, iron ore and salt licks, although grazing still remains a common right.

The rights of inheritance of cultivated land and of land not yet cultivated together with the principles governing sub-division are exceedingly complicated, and the Report adds: "No Native Tribunal or District Officer would think of settling a claim without reference to the Mbari elders who alone would be in a position to throw light on each case".

The factors which have brought about modification, if not disintegration of the existing system, are naturally principally if not exclusively connected with European immigration. Apart from direct legislation on matters of land tenure, the main contributory causes have been: (a) the fixation of Native Reserve Boundaries; (b) the growth in population of the Province due largely to the settled conditions and the protection afforded by the Government; (c) the introduction of money; (d) the increased planting of permanent and economic crops.

So long as expansion of territory was possible, there was no bar to the continuance of tribal conditions of land tenure. By the Crown Lands Ordinance of 1915 and the Amendment Ordinance of 1926, reserves of land required for the use or support of native tribes were created, and this reservation implied the converse, viz., that the land not so reserved was alienated or liable to alienation and hence expansion the native population became impossible. Accordingly when congestion could not be relieved by this means, recourse was had to sub-division and the tendency to individual ownership of land was inevitably strengthened.

The increase in population which gives rise to this congestion is very marked: at the present time the 1243 square miles contained in the Kiambu, Fort Hall and Nyeri Districts carry a resident population of 370,096, or a density of 298 per square mile. The more distant areas are at present more sparsely populated, but the average density for the whole of the province is 116 per square mile. This high density results from the great fertility of the soil and its close cultivation.

As money gradually becomes the medium of exchange in place of stock, it inevitably becomes more difficult for the Elders of the tribe to control transactions which necessarily take on a more individual and commercial aspect. It is generally recognised that permanent cropping tends to bring ownership of land on to an individual basis.



In addition certain difficulties inevitably arise in connection with developments necessary for the progressive well-being of the natives in the Reserve. For example the cession of land for the purpose of forming a township is liable to be met with the most stubborn opposition, since under the true Githaka system an outright purchase of land is impossible and hence the tribal conscience is aroused by any proposal of the kind. The same is true of the requirements of social service, such as the permanent buildings desirable for churches, schools, dispensaries, village post offices, nurseries for tree-seedlings, etc. There is in fact no land proper to a public undertaking, although an individual may build on the land of his own family group. Permission may be obtained from the Muramati, as has been done in the case of some three hundred Mission schools in the three districts, but this permission is revocable at will, and the Muramati claims the right to veto the planting of school gardens and the erection of permanent buildings. In short, to quote the Report : " The method by which this opposition can best be overcome and the sympathies of the natives be enlisted for their own advancement is a problem of some magnitude ".

On the other hand the consent of the tribal authorities has always been given to the construction of roads and ways when these have been shown to be of public benefit, in fact probably fewer difficulties have arisen than would have been the case under a system of private ownership ; the value of a communal system, such as that of the Githaka, finds proof here.

It will be seen however that the tribal theory is not easily adaptable to any system of tenancy, and the position of tenants becomes precarious, as the basis of friendship disappears and the commercial spirit grows in respect of these arrangements. Another potential difficulty which in the Kiambu District will soon call for serious consideration is that occasioned by the continued splitting of the new areas formed by the growing practice in that District of sub-dividing and selling parcels of land. The need for regulation in the near future is becoming apparent.

The situation thus appears to be that the Githaka system is now, owing to the action of the various causes indicated, in course of evolution towards individualism, an evolution which cannot be checked, but may be guided and controlled. It therefore remains to enquire into the principles of the guidance in this respect at present provided by the Administration of the Colony and Protectorate of Kenya and to indicate the lines, as proposed in the Report, along which any further regulations will have to be framed.

The principles viewed as essential by the British Government in regard to native land policy are set out clearly in the Memorandum on Native Policy in East Africa circulated in 1930 to the Governments of all the East African Dependencies. It is therein stated that the first essential is to remove finally from the native mind any feeling of insecurity in regard to his tribal lands. Side by side with this it is regarded, as of the utmost importance to ascertain and define the customary rights of occupancy or user in land within the Native Reserves (*or*, in territories where Reserves do not exist, the native areas). It is also stated to be the intention, while recognising such rights, that every member of the tribe who wishes individually to cultivate land in the Reserve should be able to find land which he can use for the purpose (1). On the other hand, when the general interest so requires,

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(1) It should be noted that although the Kikuyu native may still have much to learn as regards methods whether agricultural or pastoral, he is naturally an industrious and intelligent cultivator, and his traditional knowledge of the soil and its potentialities is an asset that cannot be disregarded in schemes for the agricultural development of the territory.

expropriation of larger or smaller plots for new purposes of public utility should not be precluded, but at the same time it is considered as of the highest importance that no such compulsory expropriation of land once definitely allocated to native occupancy or use should ever be permitted for the mere private or personal advantage of any individual, whether of European, Indian, African or other race. If such expropriation is required for public purposes, it should take place only after due notice, full explanation to the natives of the purpose, and a formal public enquiry by some competent tribunal which should determine the compensation to be made. Land allotted in compensation must be land obtained from areas not previously allocated to the natives, equal in extent and as far as possible in agricultural quality, convenience and market value.

It is of interest to note that this Memorandum also contemplates the possibility of individual natives acquiring land on purchase or lease *outside* the Native Reserves, and adds that "the obligation of trusteeship requires that effective opportunity should be afforded to the natives... to take up individual holdings of appropriate extent on lease or by purchase with payment by easy instalments, for cultivation by themselves and their families, on terms that will render this policy genuinely practicable". It will be remembered that in the Union of South Africa, on the other hand, no native is at present allowed to hold land on any terms outside the native territories.

In May 1930 before the circulation of this Memorandum the Government of Kenya passed the Native Lands Trust Ordinance under which the Crown is definitely declared to be Trustee of Natives Lands, and Native Reserves as gazetted in the Ordinance of 1926, "are reserved and set aside for the use and benefit of the native tribes of the Colony for ever".

By the terms of this Ordinance, all lands in native reserve whether already scheduled in the Gazette, or to be later created, and all matters relating thereto are placed under the management and control of a Native Lands Trust Board. This Board, consisting of the Governor, and a prescribed number of official and non-official members, with provision for the appointment of a competent African, acts in consultation with Local Advisory Boards consisting of two official members, one non-official European member and one African member, with the Chief Native Commissioner as *ex-officio* member of every Local Board, constituted for every administrative district in which one or more native reserves may be situated. The wording of the Ordinance safeguards the granting of leases of land in any Native Reserve, by requiring that any such proposal must be previously brought before the Native Local Council of the natives concerned, and also that there must be reason to believe that benefit to the natives concerned will ensue. On the other hand the Governor is empowered to exclude from the Reserves land required for public purposes, and to carry out necessary works on such lands.

The existing tribal land tenure system is highly complicated (1). While already in process of evolution towards individualism, it yet retains elements that block the way to the development of private property. If the Crown is trustee it is so for the tribe as a whole; neither the claims of the "share-owner" as developing occupier nor those of the cultivating tenant can be ignored. It is the opinion of many competent to judge that under the Githaka system there is a tendency

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(1) The Report remarks with reference to the working of the Githaka system (p. 41): "the impression is certainly created that, but for a liberal tempering of theory with common sense and a degree of convenient forgetfulness, the system would break down under the weight of its own complexity".

to create a landlord class or at least a class of privileged families, and that the "Aramati" tend to become trustees of sectional interests. For example, it may be to the advantage of the Mbari, or family group, to allow large areas to be used merely for pasturage for uneconomic goats with a resultant shortage of land and congestion in the cultivated areas. On the other hand, if the patriarchal powers of the Muramati become weakened the result is a general weakening of the respect for authority, and as the Report says: "The policy of working through Chiefs, which is the accepted policy of Government, depends for its success on the respect that the elders can command". There is a further danger, on which some stress is laid in the Report, connected with the tendency towards development of small holdings. If the small holding, by too strict an adherence to the existing system, is to be treated as a miniature Githaka, then by the action of the complicated rules of inheritance in a comparatively short time sub-division will have been carried so far that the part falling to each share-owner will be too small for practicable cultivation. It is of no advantage to the natives if, by too great a fidelity to native custom, a state of things is brought about that has proved disastrously uneconomic in other countries, notably in India.

It was ascertained by the Committee that the consensus of native opinion was for the retention of the Githaka as the unit, and although some doubt exists as to whether the same thing is meant in all the districts concerned, it is clear that the general desire is that the Mbari or family groups shall be secure in the possession of their lands both for the present and for the future. All natives of all sections are completely at one in asking that land disputes should be settled with due regard for native custom and with due knowledge of it. The Fort Hall natives stated: "Judgments which have been justly given in the Native Reserves by the authorities on the spot who do know the native law and custom, are reversed on appeal (to the Supreme Court at Nairobi) on technical points of English law which are entirely inapplicable. We ask that native land cases be removed from the jurisdiction of the Supreme Court and placed under the District Commissioners". The fall significance of this request will be realised when it is remembered that on the one hand the terms of reference of the Committee direct that "due regard shall be had to Native law and custom", and that on the other hand by the expression "the authorities on the spot who do know native law and custom" is certainly indicated the District Commissioner who is also the immediate representative on the spot of the trusteeship which is vested in the Crown. This opinion of thinking natives thus seems to reflect their confidence in the possibility of a reformed Githaka system, and may be said to be in virtual harmony with the view expressed some time ago (1) by a high administrative authority: "It seems preferable that the natural evolution of Land Tenure should not be arbitrarily interfered with, either on the one hand by *introducing foreign principles and theories not understood by the people*, or on the other hand by *stereotyping by legislation primitive systems which are in a transitional state*".

The proposals made by the Committee for rules to be made under the Native Land Trust Ordinance to govern the occupation rights of Tribes, clans, families or individuals may be summarised as follows:

The setting aside of land by Government for a tribe does not confer on that tribe the right to alienate such land or any part of it to any person not a member of that tribe. In other words the land is strictly reserved for the tribe's own use.

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(1) LUGARD Lord: *The Dual Mandate in British Tropical Africa*. 1926.

Such use and occupation of the land by the members of the tribe must be governed by native law and custom so far as it does not conflict with the law of the Colony.

A District Commissioner may require that all Githaka within an area be marked out within such time, in such manner and in the presence of such witnesses as he may direct. The method of marking by the use of certain trees and plants in accordance with native custom is however to be preserved.

Registers of Ithaka should be opened in every District under the District Commissioner wherever orders have been issued as above for the marking of Githaka boundaries. These registers should contain :

- (a) A serial number for each Githaka with date of registration ;
- (b) A careful description and estimated area in each case ;
- (c) The name of the tribal or family unit or individual occupying the Githaka ;
- (d) The name and other particulars of the Muramati.

The fee for registration should include cost of a certified copy.

All disputes over Githaka boundaries of over any matter relating to the occupation of land in any Githaka should be first referred by the parties to the local clan elders. Where an agreement is not reached the matter should go to the Native Tribunal which should be given power to deal with such cases.

Any member of a tribe has the right to apply to have any entry in a Githaka register corrected for adequate reasons.

A certified copy of any entry in the Githaka register should be issued to the Muramati with safeguards against its use as a negotiable instrument.

Any " native tenant " who is given notice to quit his holding should have the right of appeal to the District Commissioner who can forbid the eviction if he is satisfied that there is no reasonable cause or that there is no land in the Reserve on which the affected persons can be accommodated.

Erection of permanent buildings in a Native Reserve by any person not a share-owner " of the land to be used for the purpose requires either the permission of the owners covered by the written sanction of the District Commissioner, or the sanction of Government under any rules that may be made.

Roads for general use and convenience of the native community may be made where necessary through any Githaka on the authority of the District Commissioner. Special rules apply to private roads of access over a Githaka.

The free use of common minerals for their own purposes should be allowed to native in their Reserve subject to native law and custom.

In the Kiambu Reserve purchase of land for maintenance and support should be allowed between natives of the same section of the tribe subject to the sanction of the Provincial and the District Commissioners. Such sales should be duly recorded by entry in the Githaka register.

The Committee add that the above rules are suggested first for the Kiambu district only, and the final paragraph would apply exclusively to the exceptional custom of that area. They add that if and when registration of Ithaka is undertaken in other districts, registration of *Muguri* rights, i. e., the rights of the holder on the basis of a redeemable purchase, must also be registered.

The Committee also urge the importance from the native point of view of taking steps to enact a Native Courts Ordinance which should enable native courts to be established which should be independent of the Supreme Court at Nairobi.

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## ECONOMIC AND SOCIAL CONDITIONS OF THE AGRICULTURAL CLASSES

### New Developments in Economic and Social Agricultural Legislation in Spain.

The Government of the Spanish Republic has recognised from the first moment of its constitution the necessity for giving the fullest consideration to the problem of the legal agrarian reform. On the one hand it appeared necessary to revise the whole of the previous legislation, so as to secure for the institutions established under former laws their full efficacy and to bring them into harmony with the spirit of social justice. On the other hand certain legislative measures were essential as preparing for and facilitating the execution of the agrarian reform as a whole, a problem which is of the highest possible importance for Spanish agriculture. The following is a survey of those measures which on account of their greater importance stand out from the rest of the new legal reform.

I. *Mixed agricultural juries*. — On 9 September 1931 the Decree issued on 7 May of that year was declared a Law of the Republic under the title of " Law organising mixed agricultural juries " (*Ley organizando los jurados mixtos agrarios*). The object of this measure is to fix conditions of farm work and to regulate relations between employers and farm workers, as well as between landowners and tenants and between cultivators and the manufacturers who transform the agricultural raw materials. Three types of mixed juries have been established, as follows :

(a) Mixed juries of farm work appointed by associations of workers and employers' associations for regulating the conditions of agricultural labour ;

(b) Mixed juries of rural property, appointed by landowners' associations and tenants' associations for the purpose of regulating the relations between these two classes ;

(c) Mixed juries of production and agricultural industries, with the function of co-ordinating the interests of agricultural production and those of the industries manipulating or transforming agricultural raw products.

The principal functions of the mixed juries of farm work (*Jurados mixtos del trabajo rural*) are : to establish conditions of regulation of work, to prevent disputes between capital and labour and in the case of such disputes arising to endeavour to

arrive at some arrangement, to deal with individual or collective disagreements arising between employers and workers, to supervise the observance of the legislation on social insurances, etc. relative to agricultural work ; to organise Labour Exchanges so that at any time steps may be taken to prevent unemployment ; to make proposals to the Government in regard to measures of a technical or occupational character which are considered necessary for the well-being and development of agriculture ; finally to fulfil any other function that may be of benefit to the workers on the land.

The mixed juries of farm work will be composed of a president, a vice-president, a secretary and 24 members, twelve representing the workers' class and twelve the employers.

These juries will be formed in the regions and provinces in which on account of their agricultural importance it is considered necessary to have such juries. Whenever within the jurisdiction of a mixed jury of farm work there shall be found to be villages with more than 500 farm workers among the inhabitants, mixed Committees may be formed with jurisdiction over smaller areas, which although working on a smaller scale will function on the lines already indicated for the mixed juries of farm work.

The decisions taken by these juries will be by majority of votes, and in case of equal voting the president will have the casting vote, while otherwise he abstains from voting. Appeal may be had against these decisions to the Ministry of Labour who will give the final decision after having consulted the competent Committee. For any infringements of such decisions fines will be imposed, but appeal may be made against fines of more than a certain amount to the Ministry of Labour.

The functions of the mixed juries of rural property (*Jurados mixtos de la propiedad rústica*) will be as follows : to fix the bases of tenancy agreements of agricultural land according to the different types ; to regulate rents of such lands so as to prevent any kind of abuse of conditions ; to cancel clauses in these agreements liable to lead to abuses or clauses which are burdensome ; to intervene in disputes which may occur between landowners and tenants on the subject of improvements in the farms ; to annul any subletting on the petition of a party concerned ; to ensure that the tenancy agreements are in accordance with the law and likely to secure a systematic working of the farm ; to act as judge and to pronounce in cases of eviction other than for default in payment, in which case the ordinary courts will intervene.

As regards localities wherein these juries shall be formed the instructions issued are identical with those already described for the juries of farm work. Like these latter they consist of a president, a vice-president and 20 members half of whom will belong to the class of employers and the others to the category of tenants, and in the sphere of work assigned to them, their functions will be analogous to those of the juries of farm work in their sphere.

The object of the mixed juries of production and agricultural industries (*Jurados mixtos de la producción y de las industrias agrarias*) is to co-ordinate the interests of agricultural production and those of the process connected with the production, when, owing to the pressure of a superior capacity, economic or other, or from the coercive action of some force, some one of the factors of production is left in a position of obvious inferiority, and is obliged to accept actual situations contrary to justice, in which liberty of trading remains so only in name. The functions of these juries are to prevent and resolve the differences or disagreements which arise between the parties ; to interpret the clauses of the agreements concluded between the parties while laying down regulations for the due observance of these contracts and directly supervising such observance ; to denounce any prejudicial clauses in

the contracts, and chiefly those relating to prices, and finally to acquaint themselves with and to intervene in all business which either directly or indirectly relates to the working of these institutions.

The number of these mixed juries of production and agricultural industries will be fixed by the requirements of production and manufacture, and in this way mixed juries may be established of sugarbeet growers and sugar manufacturers, of wheat growers and millers, etc. These bodies will include a president, a vice-president, a secretary and from three to five members representing each of the parties, according to the importance of the activities which are to be regulated.

A Mixed Committee of agricultural arbitration (*Comisión mixta arbitral agrícola*) will be appointed to act as intermediary between the Government and the three classes of juries. This Committee will act as an advisory centre of the Ministry of Labour in all questions relating to these juries, and on it there will be represented proportionally the different elements of which the juries are composed.

2. *Forced cultivation.* — On 7 May 1931 the Ministry of Public Economy published a decree which was transformed into law on 15 September of the same year under the title of "Law declaring obligatory the cultivation of arable lands" (*Ley declarando obligatorio el cultivo de las tierras de labor*). The obligatory nature of this measure is based on the following principle: "The rights which under the Civil Code are granted to owners of rural agricultural lands, in respect of the privileges derived from ownership (*dominio*) do not extend to the option of abandoning cultivation of these lands, since ownership (*propiedad*), being a social function, cannot be separated from the operations to be applied to fulfil the objects of such ownership".

Owners of agricultural lands under a mistaken idea as to what is in consonance with their interests might abstain from doing their part towards the development of the national wealth and thereby might cause an increase in the unemployment of workers on the land. It is intended to provide by this measure against such a contingency.

According to the provisions of the law when the communal Committees of the rural police note that land which has been cleared is not being cultivated they should make a scheme for its cultivation which is handed to the owner. If he should refuse to agree to the scheme, an appeal may be made within ten days after notification to the Provincial Agricultural Department (*Servicio agronómico provincial*) and once this department has made a decision work must be begun within the space of another two days, or on the contrary the land must be considered as abandoned and will pass for any possible cultivation into the hands of peasants' labour associations legally constituted. These associations will by preference utilise the live stock and the implements of the farms thus taken over, but if none are available, then the members of the association make provision themselves. To meet the expenditure incurred in taking over these farms, e. g., cost of cultivation, wages, fertilisers, seeds, etc., the communes may make use of credits obtained through the National Service of Agricultural Credit.

The profits obtained at the end of the financial year will be distributed in the following manner: a third part to the association which undertakes the farming, another third to the workers in proportion to the quota of work performed, while the remaining third part goes to the commune and may be used to cover any deficit on any similar farm undertaking. If there should instead be a surplus, the commune may devote its share to the unemployment fund or to the Labour Exchanges.

When the provisions of this law were put into practice certain landowners attempted to elude the obligation by stating that they were not the owners of the property but merely tenants. An explanatory Order, published on 12 August 1931

provides that the obligations imposed by the law on compulsory cultivation must be fulfilled by whoever has the charge of the lands, and states that by the term "owner" in the law in question should be understood the *person responsible for the farming whether he be owner, tenant, holder in usufruct, partner, or comes under any other category in regard to tenure of the land.*

3. *Co-operative Land-holding Societies.* — Following the example of Italy and Rumania, countries in which this type of collective contract has been attended with success, the Government of the Spanish Republic passed a Decree of 19 May 1931, declared law on 9 September of the same year (under the title of *Ley sobre Arriendos colectivos*), by which it is provided that the peasants' labour associations legally constituted may conclude collective landholding agreements in relation to one or more farms. . . "with the object" to quote the law "of remedying the periodical unemployment of the farm workers, and counteracting the parasitic methods of intermediaries who foster the unsatisfactory system of sub-letting. In this way the land hunger of the rural population, the noblest and most intimate aspiration of that calling, will find satisfaction".

Thus agreements can be entered on by the labour associations mentioned in regard to one or more farms, according to the capacity of the association, the object being to work the lands and to distribute the profits of the cultivation in conformity with compacts made among the members in that respect.

Joint landholding agreements may be applied to the following: lands under cultivation and rented which belong to the commune; lands that have fallen to the State as having been the property of persons who have died intestate; lands that have been adjudged to the Treasury on account of indebtedness, provided they are suited for cultivation; lands in private ownership given in free grant by their owners; and finally joint landholding agreements may be entered into in respect of lands not cultivated directly by their owners, so soon as the agreements or leases terminate which encumbered the lands before the present law. In this last case, three months before the termination of such agreement, the association which in conformity with the new legislation desires to rent the lands, may address the owner asking him whether he proposes in the future to cultivate the farmland himself, or whether, on the contrary, he intends to continue the system of letting. If the owner replies in the latter sense, the letting agreement is transferred of right to the association which so desires. This provision constitutes a privilege for the peasants' labour associations in granting them preference in the tenancy agreements over any agreements made with individuals. In view however of the popular and democratic character of the law, this preference as compared with individual agreements will not be given in the case of lands cultivated by the peasants themselves, or with the help of members of their own families, to provide for their own maintenance. The law is mainly directed against improper sub-letting.

The peasants' associations which have obtained lands on the basis of collective land holding agreements may apply to the provincial agricultural sections and to the official agricultural experiment and instruction stations for technical advisory assistance which will be given to their members in regard to selection of crops, methods of cultivation, commercial organisation of sale of products, etc. These associations can also obtain from the National Service of Agricultural Credit (*Servicio Nacional de crédito agrícola*) and from the *Pósitos* the loans they require as working capital. Assistance is also given by the State in regard to insurance, the association being granted facilities for the formation of mutual insurance societies or they are permitted to benefit by the services of the official organisation for agricultural insurance (*Seguro agrícola*).



Although, in general, peasants' associations working a farm collectively are prohibited from employing the paid labour of persons who are not members and the penalty for infringement is loss of the profits allowed by the law to the associations, recourse may be had exceptionally to paid labour in the case of pressing and unavoidable necessity, where the farming would suffer if the work were not performed. In engaging such paid labour preference will be given to labour supplied by another association rather than to individual labour.

A guarantee is given to the owners of the lands of the punctual payment of the annual rent as fixed by the agreement, the law making provision for the formation of a special fund built up by the contribution of 0.25 pesetas in respect of each work day given by the members of the association.

The interpretation of the terms of this law will be within the competence of the mixed juries of agricultural property, already mentioned as of recent creation.

4. *Accidents occurring in pursuit of farm work.* — At the third meeting of the International Labour Conference held at Geneva from 25 October to 16 November 1921, a draft convention was adopted relating to compensation for accidents in employment in agriculture. The official delegation representing Spain at this Conference pronounced in favour of the projected Convention, and on 9 May 1931 the Government of the Republic communicated to the League of Nations the corresponding ratification, and at the same time instructed the Minister of Labour to introduce into the existing Spanish legislation on accident insurance the provisions necessary for adapting it to the Convention. As soon as the bases for the application to agriculture of the Law of accidents in employment were approved, there was also approved on 25 August 1931 the regulation for the application to agriculture of the Law on accidents in employment (*Reglamento para la aplicación a la agricultura de la Ley de accidentes del trabajo*), this regulation being for the future in force on this subject.

For the purposes of benefit from the law on accidents, a worker will be considered as any person executing manual work on the account of another person, and as employer will be considered the individual or corporate body on account of whom the agricultural or forestry work is executed. Liability is incurred in respect of employment connected with : the cultivation of the land in all forms and forest working, whether in either of these machinery is utilised or not ; stock-breeding, stock farming and the care of live stock ; employment in connection with hunting or shooting of game or with river fishing ; work subsidiary to agriculture, such as land drains, irrigation works, land improvements, etc., provided that such works are not of sufficient importance to be included under the general legislation of accidents in employment, otherwise they fall under that law ; and finally liabilities are incurred for accidents taking place during the preparation, elaboration, transformation or sale of agricultural, forestry and live stock products.

The terms of the regulation are intended to bring within the scope of the general law on accident insurance any accidents occurring to land workers during the execution of any of the forms of employment mentioned. For this reason reference need not be made to such clauses inserted in the insurance policy for accidents in agriculture as bring it into line with the general principles that govern these insurance agreements in all legislations as regards liability, medical attendance and supply of medicines, risks, losses, compensation, etc.

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DIE DEUTSCHE LANDWIRTSCHAFT UNTER VOLKS- UND WELTWIRTSCHAFTLICHEN GESICHTSPUNKTEN. — Dargestellt unter Verwertung und Ergänzung der Arbeiten des Ausschusses zur Untersuchung der Erzeugungs- und Absatzbedingungen der deutschen Wirtschaft in Gemeinschaft mit zahlreichen Fachgenossen von MAX SERING. 50. Sonderheft der Berichte über Landwirtschaft. Berlin, 1932. P. Parey.

[As shown by the title, the above volume originated in the work of the agricultural sub-committee of the *Enquete-Ausschuss* set up in 1926 to examine the conditions of production and sale in Germany. This sub-Committee published a number of reports of a basic nature on the situation of the various branches of German agriculture, and was then compelled in 1929 to suspend activities without having prepared a general report. The present work by SERING takes the place of such a general report, but the whole range of the problems is considerably widened, from the fact that the writer not merely summarises the investigations of the Enquiry Committee, but also brings them up to date.

The book is intended to present a picture of German agriculture of to-day, its methods of work, its success or want of success. The object is to state the natural conditions as well as the conditions of national and world economy under which German agriculture is being carried on, together with the essential consequences of these, so that a basis may be reached for the consideration of the economic, social and political problems that await solution.

Such a task could only have been compassed by an agricultural economist of the eminence of Max Sering. In its prosecution he was able to obtain assistance from the German Research Institute for agriculture and land settlement (*Deutsches Forschungsinstitut für Agrar- und Siedlungswesen*) of which he is the president and also from a number of well-known German agricultural economists.

There is scarcely a single agricultural problem that does not receive treatment in this book. It is characterised throughout by a lucidity of plan and a concentration in form, the object being to give primary emphasis to the main permanent lines of development. Owing however to the great number of the questions treated the outcome is a volume of over 1000 pages. It will remain for long the basis for investigations and measures relating to German agriculture; in short the chief work of reference on the subject.

Chapter I deals with the supplies of agricultural and forestry products available for the German nation before and since the war. Chapter II surveys the situation of German agriculture, the course followed by farm receipts and expenditure, the shrinkage of the farmer's income as the result of high taxes and interest rates, the indebtedness of agriculture and the consequences. Chapter III gives a sketch of the changes in conditions of production and marketing since the conclusion of the war, and discusses the international price movements, the fluctuations in personal and in land mortgage credit, work and wages in agriculture, the rural exodus and the charges burdening agriculture before and since the war. Chapter IV examines the bases of German agriculture and the adaptation of farms to the changed economic conditions; it discusses also the geographical division of Germany into agricultural zones, taking into account the nature of German cultivable land, climate and utilisation of the soil, importance and distribution of the different size categories of farms, density of population, the farms in their relation to the markets; the change over since 1913 in agricultural production in the different parts of Germany. Chapter V contains investigations into the situation of the family farming class and the means of maintaining it in the regions with less favourable conditions. The effects of the agricultural crisis on this class, the tendency for it to become proletarian, the continuous overwork for both sexes and the possible remedies, are discussed. In Chapter VI the writer states his views on the development, situation and general outlook of the different branches of German agriculture; cereal growing and utilisation, including cultivation, milling, baking, marketing; stock farming, increase in stockbreeding output, the balanced ration etc., sales of livestock and meat, dairying, poultry keeping, etc.; root crops, market gardening, fruit-vine-hop-and tobacco-growing. Chapter VII is an investigation of the measures to be taken for the encouragement of German agriculture, including agricultural education and advisory work, co-operation, modification in the methods and in the organisation of the marketing of agricultural products, reform of agricultural credit and reduction of indebtedness, reform of the law

of succession for rural property, farm land settlement, reduction of public charges, plant protection, control of live stock epidemics etc. consolidation of parcels, land improvements, increase of crop yields by means of seed selection and fertilising, mechanisation of farm work, tariff measures and their effects. In the last chapter the author concludes, with a retrospect and a glance at the future, a remarkable work which in addition to the indications given of the principles and methods to be followed in the protection of German agriculture presents an admirable account of the world agricultural crisis and its effects on agriculture in Germany].

WOITINSKY, WL. : *Internationale Hebung der Preise als Ausweg aus der Krise*. (Veröffentlichung der Frankfurter Gesellschaft für Konjunkturforschung, herausgegeben von Dr. Eugen Altschul, Neue Folge, Heft 1) Hans Buske Verlag, Leipzig, 1931. (VI.-163 pp.).

[The *Frankfurter Gesellschaft für Konjunkturforschung* has already to its credit several interesting studies on various aspects of the problem of economic fluctuations and business forecasting. They include important original contributions to the statistical methodology of the subject, by Oskar Andersson, Simon Kuznetz, Hans Peter and others.

The book under review deals with a cardinal and highly controversial problem of the present economic situation, namely, with the means by which the world crisis could most effectively be overcome. The choice of the remedy naturally depends on the diagnosis of the complaint; and the analysis by the writer of the origins of the present depression presents considerable interest.

The writer thinks that "the belief, based on pre-war experience, that the economic situation would right itself, is not justified under present conditions", and that the solution of the crisis must be brought about by deliberate action. Accordingly, he insists that the study of market conditions — *Konjunkturdienst* — should aim not only at diagnosing the situation and forecasting its probable development, but also at evolving remedies for the treatment of the disease. In face of the crisis, he is all in favour of action. He refuses to accept *Konjunktur* as an elemental phenomenon which must be investigated but cannot be brought under control. In this he differs from the accepted view of the German and other students of the subject, the majority of whom adhere to what he describes the diagnostic or meteorological school of research.

The writer's reasoning hinges on his conception of the generation and nature of long waves in business fluctuations. This differs from the orthodox German doctrine, as represented by Wagemann, in that, while the latter considers long waves to be rhythmic, but does not admit of the possibility of finding their explanation, Mr. Woitinsky says that, to him, "the most controversial and doubtful point of the problem of long waves is precisely their rhythmic character"... "As far as their causation is concerned, one should seek for explanation, and there is no doubt that such explanation would eventually be found"... He thinks, indeed, that in this direction much has already been achieved by recent research, including his own work on long business waves. His view is that the long waves are not necessarily rhythmic; they are rather the expression of certain trends of development, not necessarily recurrent. As to their causes, these should be looked for not in any mysterious agencies, but in the forces which determine the movement of prices, and more particularly in the monetary factors of price formation.

From an analysis of the frequency distribution of price series before and since the war, as well as in the course of 1930, the writer draws the conclusion that, before the war, the economic situation was dominated by forces which determined a strong sustained upward trend of prices, while now the dominant pressure is in the opposite direction. He thinks — and in this he finds ample support in the views of many authorities, including the Macmillan Commission and the Gold Committee of the League of Nations — that the "general factors" of the world economic crisis can be reduced to money and credit conditions; and since such in the origin of the trouble, a remedy for it must be sought in a well devised scheme of monetary policy. This remedy the writer sees in the creation, by the action of a specially established international financial organisation, built on principles similar to those of the Bank of International Settlements, of additional purchasing power, and in its equitable distribution among the different countries in the form of capital and credit.

The Editor of the Society's publications, in recommending the book to the public, as a valuable piece of research, dissociates himself from the author's "therapeutical" view of the aims of *Konjunkturforschung*, as well as from his prescription. As a study of the present crisis, the book is instructive and stimulating].

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(2) List of abbreviations: bihebdom. (biweekly); b mers. (twice monthly); bimestr. (every two months); étr. (subscription for foreign countries); hebdom. (weekly); int. (subscription for home circulation); irr. (irregular); mens. (monthly); 1.º (No.); N. S. (new series); trim. (quarterly); v. (volume).

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# MONTHLY BULLETIN

OF

## AGRICULTURAL ECONOMICS AND SOCIOLOGY

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No. 4

### FARM ECONOMICS

#### Recent Investigations on the Economy of Native Farming in Java.

*On the occasion of the meeting in November 1931 of the Commission for Agriculture in Tropical and Sub-tropical Countries which forms part of the International Scientific Agricultural Council, a discussion took place on the paper read by Professor MAUGINI on the methods to be followed for developing native agriculture in the Colonies. In the course of this discussion the inadequacy was noted of existing documentation on the economic conditions of native agricultural production, and with a view to ensuring the uniformity of studies relating to this question, a recommendation was made that there should be prepared by the Institute in collaboration with M. MAUGINI a questionnaire or an enquiry for sending to all the countries concerned.*

*The writer of this article who was present at the meeting regrets that he had no opportunity of informing the Delegates that enquiries of the types recommended by Professor MAUGINI have already been initiated and are in progress in one tropical country, namely, Java. An examination of the reports recently made in this connection by Dutch and Javanese agricultural engineers should accordingly be of considerable interest. The study of these published investigations reveals the very great difficulties encountered by these experts in dealing with economic questions in tropical countries. These difficulties are serious in Java, a country with an age-long tradition of native agriculture; they are immense in colonial areas where the transition from the "shifting" cultivation to more or less stable agriculture is being effected only within our own times.*

#### I. — PUBLIC SERVICES OF THE NETHERLANDS INDIES DEALING WITH NATIVE RURAL ECONOMY.

Any account of the work recently carried out by Dutch agricultural engineers should be prefaced by a brief summary of the organisation of the agricultural services in the Netherlands Indies.

The Department of Agriculture of the Netherlands Indies was founded in 1905. At first the Central Government only occasionally gave attention to native agriculture, and there was no organisation which was in touch with the requirements of the native peasant class. The establishment of services of agricultural information and instruction entirely depended on the decision of the Civil Service. The same was the case with experimental work which at that time had reference mainly to rice cultivation.

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(1) This article, prepared by Dr. BALLY, Chief of the Section of Tropical and Sub-tropical Agriculture, is intended for the next meeting of the Bureau of the Commission of the C. I. S. A. for Agriculture in Tropical and Sub-tropical Countries, fixed for May 1932. As the article is of an economic character, it is being published in this Review.

The institution of the Department of Agriculture was due to the foresight and initiative of Professor Melchior TREUB, Director of the Buitenzorg Botanical Gardens. This celebrated botanist convinced the Government of the necessity for establishing a technical Bureau the main function of which would be to enquire into the possible methods of increasing the yield of native cultivation.

The history of the Department cannot be detailed here; it is enough to say that its activities have shown a steadily progressive extension. At the present time, it includes eleven sections, namely: the Botanical Garden, the Agricultural Experiment Station, the Section "Agriculture", the Government Plantations, the Section of Sylviculture, the Veterinary Service, the Section for Industry, that for Trade, the Bureau of Weights and Measures, the Central Purchasing Service, and the Central Statistical Office.

A special corps of agricultural advisors, "*Landbouwadviseurs*", was formed in 1908, as it was felt that the relations with native agriculture and the inspection of demonstration fields should be entrusted to competent persons, that is to say, to qualified agricultural engineers. The institution of this corps was of fundamental importance; the service began on a small scale but was gradually extended. It was only in 1920 that the services dealing with native cultivation were grouped into the Section "Agriculture" (*Afdeeling Landbouw*). An idea of the size of this Section may be gained from the fact that in 1930 it included 208 persons, namely; one Chief of Service, 5 Inspectors of Native Agriculture, one Inspector of agricultural education of natives, one assistant inspector for Native Agriculture, 62 advisors in agriculture and horticulture (*Land en Tuinbouw consulent*), 135 natives acting either as instructors in agriculture or as assistant advisors, 12 officials for agriculture (*Landbouwkundig ambtenaar*), 13 officials for horticulture and 68 superintendents.

It is evident that a service specialised in this way is able to study economic questions in full detail. The archives contain abundant material to which additions are constantly made, but it is only in recent years that proper co-ordination of the data has been attempted together with a detailed analysis of the economy of the native farm holdings. In the following pages the methods of analysis employed will be discussed and examples will be given illustrating the plan of work (1).

## II. — PRINCIPLES OF INVESTIGATIONS AND METHODS EMPLOYED.

As already stated, attention has been given for some time past to the economy of native farming. Before the foundation of the Department of Agriculture, the officers of the Colonial Civil Service, who were fully acquainted with the needs and the psychology of the native population, gave much consideration to the question, and their reports contain much valuable material. Since 1908, the advisors on agriculture have made it their business to gain an understanding of and to effect analysis of native farming operations.

At first, each adviser applied in his own district his personal ideas. With a view to securing uniformity of method the Chief of the Section of Agriculture in 1921 addressed a circular to all the advisers, the object of which was to obtain in future more complete data, especially from the statistical standpoint. The following questions were included in the circular:

1. How many hours of work are required for the ploughing, harrowing,

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(1) For a fuller account of the history of the Service, the reader is referred to the article by B. A. PARRELS, included in the bibliographical list attached.

transplanting, hoeing and harvesting on one "bouw" (1.71 hectares)? — It is desired to determine the hours of work for a certain crop in a given region, and it is advisable to make the observations in respects of a single farm holding.

2. What is the number of hours of work given by the members of the family, by the friends, and by paid coolie workers? Do the male workers work for a full day during the busy season? What is the practice in the case of women workers? Do these latter engage in other productive work, during the remainder of the day?

3. Is assistance paid for in cash, in food or in a share of the produce?

The Chief of Service, while leaving the advisers every freedom in the choice of the means they employ for obtaining the required facts, recommends that the examples shall be selected from among the model farms of the given region. He advises that continuous contact shall be maintained with the peasant farmer, without interference in or hindrance of his work.

In 1923, a paper was read by A. M. P. A. SCHELTEMA, Ing. agron., in which he discussed the theoretical bases, the importance of the economic analysis of farm, the forms of native labour and the application of the terms devised by the economists in Europe. In addition, reference was made to the difficulties that had occurred in the course of previous investigations as well as to those that might be expected to recur. An attempt was made at comparison of the figures obtained by economists in Europe, with special reference to Prof. LAUR's investigations in Switzerland, with those collected by KOENS at the Residency of Preanger. This was scarcely practicable but was regarded as likely to give some useful results. At this point the main conclusions of SCHELTEMA may be given, returning later on to the principles on which the work should be conducted. The following is the summary of the paper:

I. In order to analyse native agriculture, it is first necessary to consider the stage of development of agriculture and of the community. Native agriculture in Netherlands Indies presents great contrasts: on the one hand a very primitive cultivation on virgin land cleared of forest carried on by communities still in the stage of barter-economy, and on the other hand a capitalistic cultivation of commercial crops on a large scale with almost complete money economy.

II. The economic analysis of native farming is essential:

(a) for the farmer himself;

(b) for the Agricultural Information Service;

(c) for the solution of various general economic and agricultural questions; for example, the prospects of food production; assignment of fallow lands to be leased to the sugar estates; fixing of the amount of the land tax, or "landrente"; the possible industrialisation of Java.

It may be added that the agricultural engineers are never used as intermediaries for payment of taxes by the native farmers; it is justly considered that the native farmer would lose all confidence in these officers if any assessment for taxation of crops were included in their duties.

III. Wages in native agriculture are paid partly in money, partly in kind. The manner of payment depends on the amount of liquid capital at the disposal of the cultivator, and on the size of the holding.

IV. For the calculation of the net returns of native holdings it is sufficient, in the majority of cases, to take account of the net returns expressed in cash and of the farming costs. On the other hand, interest on capital, depreciation of buildings, live stock and implements, increase and diminution of capital, all factors that are of great importance in farming in temperate countries, may be disregarded. It

is also unnecessary to deduct wage claim for the personal labour of the cultivator and his family.

V. The data obtained by A. J. KOENS as regards rice cultivation in the Regencies of Preanger have shown that :

(a) The number of hours of work given to transplanting, cultivation of the crop and harvesting varies considerably from one farm to another : the difference is less as regards ploughing, harrowing and levelling.

(b) The work required for transplanting, weeding and harvesting is very heavy.

(c) As compared with European farming, where the largest gross returns and the highest net profits correspond to the highest production costs, on the Preanger rice farms it has been shown that the maximum production costs coincide with the lowest net profits and relatively small gross returns.

(d) The high net profits obtained by the Preanger rice farms in 1922 were due to high prices, and to a less extent to the abundant yields of rice.

(e) If the holdings are grouped according to costs of cultivation, the average costs of transplanting, weeding, etc. and harvesting, calculated per picul rice in straw, show relatively little variation.

(f) The costs of the different kinds of work, calculated per unit of area, vary considerably ; the spread is least in respect of the costs of ploughing and harrowing.

(g) The cultivation of rice is very intensive as regards labour as compared with rice growing in Italy or hoed crops in Holland ; on the other hand it is extensive as regards capital.

VI. Data obtained in the principality of Surakarta by F. BOOGERD have shown that in rice cultivation the return from labour has been very small on account of the low prices of the product.

From 1925 to 1930 a very large amount of work was accomplished by the agricultural advisers and there was a steady increase in the number of analyses made. The results of the enquiries were published in a new review, " Landbouw ", founded in 1925. As the reports appeared the need for a new general direction of the work began to be felt. This question was fully discussed by a meeting of the agricultural advisers in October 1930, which took as the basis of discussion the report of E. de VRIES, an agricultural adviser of great experience who has himself conducted a large number of enquiries. This report contains a discussion of some theoretical considerations, a bibliography of the published enquiries and instructions to be followed by those responsible for the direction of the enquiries.

De VRIES begins by pointing out that our knowledge of the economic bases of native farming is inadequate. The farms may be grouped according to various bases of classification, but it is not possible to make these distinctions until the results of the enquiries have been studied. To preface these enquiries by placing any farm in a fixed group on *a priori* grounds is thus to commit a blunder.

The author has endeavoured to make use of the terminology of Professor LAUR, which was accepted in 1929 by the International Congress of Agriculture at Bucarest. In his article he reproduces the definitions given in the *Monthly Bulletin of Agricultural Economics and Sociology* of the International Review of Agriculture of September 1929. In the course of the discussion that followed the reading of de VRIES' paper, a number of objections were raised. The terminology was pronounced to be much too complicated for native farms, and as it is largely of a commercial character, it is not well suited to primitive types of farming where the object is not commercial but merely that of providing subsistence for the farmer and his family. In the end, however, for want of a better, one is driven to employ

this terminology which is designed for the use of European and American farmers.

The distinctions between the different kinds of farms are difficult and sometimes impossible to establish, as the transitions are very gradual between one group and the next. This is the natural result of the development that has taken place during the last few years. The economic life of Java, which remained stationary for centuries, is increasingly influenced by the new means of communication and by the rapid growth of the population, as shown by the following figures :

*Native Population of Java and Madura (1).*

In 1850. . . . .	9,500,000 inhabitants
In 1875. . . . .	18,000,000        »
In 1900. . . . .	28,400,000        »
In 1920. . . . .	34,400,000        »
In 1930. . . . .	40,500,000        »

The above two factors must clearly have a profound effect on the general economy and in consequence on the types of farming.

In the following attempt to establish distinctions, it should be borne in mind that a large number of intermediary forms are to be found between one and another group.

A. — In the first place the farms may be grouped according to area : dwarf, small, medium-sized and large farms may be distinguished. All these types fall under the category of farms comparable with those of the family farmer of Europe. Other large scale plantations the object of which is to obtain returns on invested capital belong to an entirely different class, and are for the most part limited companies under the management of Europeans. These estates do not come within the scope of this article.

B. — Other classifications may be obtained by comparing :

(a) farming with a view to exchange of products for cash (in Dutch : *Geldbedrijf*, shown in the diagram by the letters *e a*), with farming with a view to barter of products (Dutch : *Goederenbedrijf*, letters *e n*) ;

(b) farms worked for the market (*Marktbedrijf*, letters *e m*) with farms worked for family consumption (*Consumptiebedrijf*, letters *e c*) ;

(c) farms depending on their own resources (*Zelfstandig bedrijf*, letters *e t*) with farms depending partly on external resources (*Gekoppeld bedrijf*, letters *e e*) ;

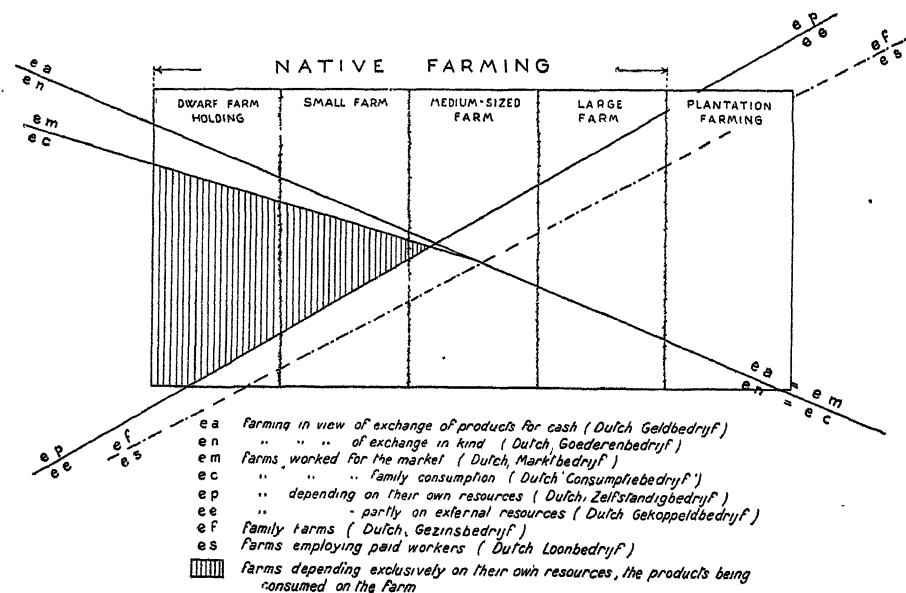
(d) family farms (*Gezinsbedrijf*, letters *e f*) with farms employing paid workers (*Loonbedrijf*, letters *e s*).

The different groups referred to under A need not correspond to those designated under letter B. At the same time certain correlations may be found between the two classes. The percentage of farms *e a* is small among the very small or dwarf farm holdings ; it increases as the area increases. The greater number of the dwarf farmholdings are family farms, while in the group of large farms the majority employ paid workers. A very clear diagram is provided by the author making it possible to see at a glance the different relations existing between the groups. This is reproduced here on account of its general interest.

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(1) Figures taken from the article of M. van der VEER.

The writer then gives a plan of campaign for future researches which should be based on complete analyses of farming. The work of making such analyses, however, is impeded from the outset by insurmountable difficulties due to the prevailing illiteracy of the peasant farmers, who accordingly cannot be expected to



keep accounts. In consequence the enquiry must be confined to a certain number only of the relevant questions, e. g.: the number of hours of work devoted to a certain field may be ascertained and the farm expenses deduced therefrom — a simple matter when it is a question of paid day labour, but difficult when the work is done by the members of the family; the farm inventory may be drawn up, particulars may be collected as to rotation of crops, etc.

The inventory consists in a list of the members of the family, of persons boarded in exchange for their work, the livestock, fields owned or leased by the farmer. Each field is given a number, and for each there is noted the field work done, the rotation and, if possible, the quantity of the crops.

The number of the hours of work may be checked in two ways: by engaging a literate native to supervise some twenty fields belonging to different owners and to note the work accomplished, or by making a complete analysis of the farm of a single peasant farmer; in this latter case, a native assistant may analyse five or six farm holdings.

Further detail of this interesting form of enquiry must be omitted for considerations of space. It may be simply stated that the author attaches great importance to the analysis of the work done in the houses and on the family plots surrounding the houses, usually planted with coconuts and other fruit trees and vegetables. No analyses have as yet been made in this respect,

### III. — EXAMPLE OF A FARM ANALYSIS.

In order to give an idea of the kind of investigations of which the theoretical bases have just been given, a careful study must be made of the analyses effected in recent years. Some ten groups of farms situated in different regions have been



analysed. This number is too small for it to be possible to draw general conclusions. A single example will be enough to give some idea of the method followed.

In order better to understand what follows, a brief account will first be given of the different crops found on the native farms of Java.

Rice stands first, and there are two kinds of rice fields: irrigable and dry. Cultivation of the irrigated fields is possible only during the months when the atmospheric precipitations allow of adequate irrigation. In the greater part of Java two very marked seasons may be distinguished, one dry, corresponding to the easterly monsoon from May to October, the other rainy, corresponding to the westerly monsoon, from November to April. On the other hand, the period between the rice transplanting and the harvest is scarcely three months. Accordingly the period of the rice harvest is very short, about three months only. There are however exceptions to this; for example, in the Regencies of Preanger there may be seen the whole year round ricefields newly planted and others in which the harvest is in progress.

For several reasons, rice cultivation required much labour. The preparation of the seedlings beds, the laying out of the channels, the making of the embankments for keeping the water on the field, the ploughing and harrowing, all require a great number of day labourers. Afterwards as the transplanting must be done very quickly, all the available labour is employed, men, women and children; the rice is planted in small bundles of three or four plants.

When this part of the work is over, there follows a period of three months during which the crop does not fully occupy the time of the available labour, so that other means of subsistence must be found. Then comes the harvest and the whole population is once again brought into action. Rice is not cut with a sickle, but the stalks are cut separately at about 30 cm. from the ear. The reapers make use of the "ani ani", a small wooden board with a very sharp steel blade on one side partly embedded in the thickness of the wood. Like many of the other methods employed in rice growing which to us seem uneconomic, this way of harvesting is dictated by the religious traditions of the country. It may be remembered that the Javanese regard rice cultivation as a religious act.

The varieties grown are extremely numerous. There are early varieties and others that ripen late. According to the variety, the ripening period may last from 70 to 140 days. The late kinds yield rice of a better quality, while if water is scarce and irrigation cannot be prolonged the advantage is on the side of the early kinds. The uninstructed peasant has a thorough knowledge of the different varieties that may be found in the region where he lives and where his forefathers have lived. As a rule he does not attempt to modify the environmental conditions in order to obtain a better crop; when these are unfavourable, when for example the soil is poor, he can find a variety adapted to this poverty.

The cultivation of other food plants, which is effected during the dry season on the fields on which the rice had been planted or on the "tegalan" (non-irrigated fields), is almost equally important. The list of these plants is long, the generic name given by the Javanese is "Polowidjo", while the Dutch call them "Tweede gewassen". The first to be mentioned is maize, a very important crop in the eastern part of Java, where the daily dietary of the natives largely consists of the products of this plant. In many regions, manioc or cassava is also of importance, and grows on the non-irrigated fields, while groundnuts, also important, are cultivated on the water fields. Mention may be also made of sweet potatoes or yams, soybean (which does not do really well in Java), many kinds of beans, cucumbers and onions, capsicums, sesamum, castor-oil plant, colocasia, potatoes and European

vegetables grown in the mountainous regions, and the list is by no means complete.

Some part of these crops is used for the food of the farm family ; and part enters into trade. The value of the exported products of native cultivation in Java has been in the last few years as follows :

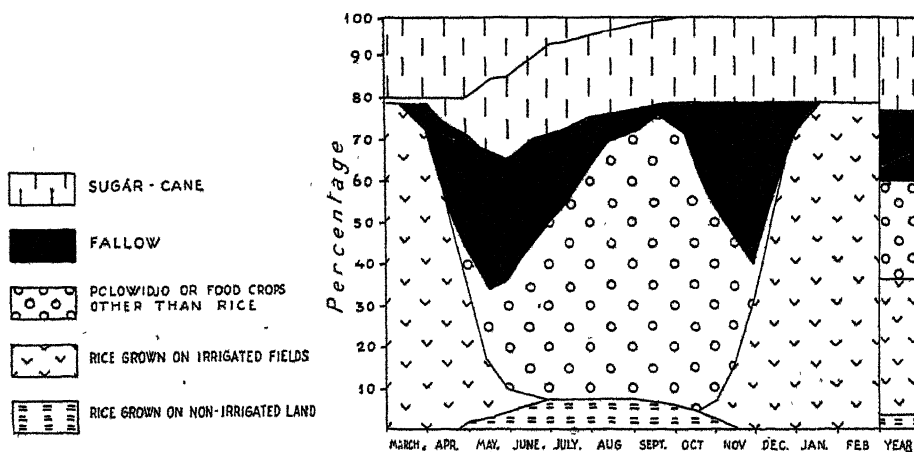
in 1927 . . . . .	80,936,000	millions of florins
in 1928 . . . . .	135,026,000	" " "
in 1929 . . . . .	104,530,000	" " "
in 1930 . . . . .	70,073,000	" " "

In addition to maize, groundnuts, manioc and castor-oil, the exports include coconut products, kapok, areca nuts, sugar, tobacco, tea.

Tobacco and sugar cane are planted on the irrigated lands, but trees or bushes, such as the coconut, kapok and areca grow on the family plots surrounding the native dwellings. There also are found the numerous fruit trees of various kinds. The area covered by the villages is very wide, and owing to the surrounding trees and bamboo plants the whole village has the appearance of a little wood.

Three sources of income may be distinguished : the irrigated fields, the non-irrigated fields and the family plots. The importance of these last, although far from negligible, is not yet fully determined, but especially in the neighbourhood of towns, fruit growing and the resulting trade form an increasing source of income.

DIAGRAM SHOWING PERCENTAGE OF FIELDS  
UNDER THE DIFFERENT CROPS



The great complexity of the rotation of crops in Java will be seen from the accompanying diagram which is taken from an article by de VRIES on the agriculture and general welfare of the region of Pasuruan. This diagram relates to a region which is irrigated regularly during the rainy season. The months are shown along the abscissa of the graph; the percentage of fields used for a single crop or still in fallow appears on the ordinate. It may be added that in this region, a certain percentage of fields corresponding to the area under sugar shown in the diagram are regularly leased to European sugar estates.

It follows from what has been said that there may be found in the different regions of Java the most varied combinations of crops. Rice cultivation is found everywhere. It may be combined with different kinds of "Polowidjo" (food-crops) or with industrial crops, tobacco, sugar cane, tea, indigo and others. The analyses published up to the present have been prepared in different regions where a great variety of crop combinations were found. The following list shows this clearly.

Author	Publication in which article appeared	Crop
SMITS . . . . .	Landbouw 1, p. 255	Rice
OCHSE . . . . .	Landbouw 2, p. 923, 4, p. 501	Fruits
SCHELTEMA . . . . .	Meded. Afd. Landbouw No. 6	Rice
VROON . . . . .	Landbouw 2, p. 511	Tea
SMITS . . . . .	Landbouw 2, p. 426	"Polowidjo"
SMITS . . . . .	Landbouw 3, p. 397	Rice (Celebes)
BRUCKMAN . . . . .	Landbouw 4, p. 798	Citrus fruit, rice and "Polowidjo"
WIERS . . . . .	Landbouw 4, p. 122	Tobacco
SMITS . . . . .	Landbouw 4, p. 672	Pepper
DE VRIES ALERS et SOEPARJO . . . . .	Landbouw 5, p. 645	Tobacco and rice
WITMOAIMODJOJO, VAN GOGH and de VRIES . . . . .	Landbouw 6, p. 77	"Polowidjo" and sugar
KORENKOEF, DJOEMITO PADMO DIHARDJO, RADEN GOENGENG ISKANDAR and WIT VINK, POERTJAJA, CADROEN and RADEN, GOENONG ISKANDAR . . . . .	Landbouw 6, p. 674	Sugar
VINK et DE VRIES . . . . .	Landbouw 6, p. 729	Rice, sugar and "Polowidjo"
VINK, DJOJODIHARDJO and RADEN GOENONG ISKANDAR . . . . .	Landbouw 7, p. 1	Rice "Polowidjo" and tobacco
VINK, DJOJODIHARDJO and VAN DEN BRAND . . . . .	Landbouw 7, p. 107	Rice and "Polowidjo"
	Landbouw 7, p. 408	Rice

Space does not permit of giving summaries of all these articles in spite of their great interest. By selecting one out the number, that of VINK, DJOJODIHARDJO and RADEN GOENONG ISKANDAR, an idea may be gained of the methods followed; it relates to a village where the kind of rotation in use is typical and may be taken as normal.

The fields analysed, those of the village of Djetis, are situated in a region with a loamy soil. When dry, this soil is as hard as a stone and cracks freely. On the other hand, if there is a quantity of water, ploughing becomes impossible as the work animals sink too deep in the mud. The system of cultivation to be followed is thus dictated by the degree of moisture of the soil.

The analyses cover two rainy seasons, of rice cultivation (1926-27 and 1927-28) and two dry seasons, of "polowidjo" cropping (1927 and 1928). An idea of the considerable differences in humidity will be gained from the following table which shows the rainfall in millimetres over three years.

TABLE I. — *Rainfall in millimetres.*

Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total
	Month												
1926 . . . . .	570	668	579	206	124	—	—	—	—	—	121	419	
1927 . . . . .	411	380	342	246	91	39	1	83	—	78	84	133	
1928 . . . . .	302	383	259	161	167	182	42	4	3	2	189	284	
Average of several years . . . . .	358	369	314	168	113	58	47	10	26	62	132	307	1,905

\* — *Ec. + Ing.*

The fields are not the property of individuals but of the commune, and these common lands are divided each year, when the rains begin, in separate allotments among those persons in the village who are entitled to land. Hence the distribution of fields in 1927 was quite different from that obtaining in 1928. The total area of the lands analysed was also different in the two years. In 1927, the analysis covered 19.5 hectares, in 1928 an area of 22.7 hectares. The number of lots formed was twenty, and the size of the fields cultivated by an owner varied from 0.15 to 2.1 hectares. During the rainy season, those entitled to land cultivate their fields themselves; during the dry season, many seek another occupation and leave their fields, without asking for any compensating payment, to other cultivators, who grow "polowidjo" on them.

The data relating to the rice fields and those relating to the same areas when under "polowidjo" will be given separately; in conclusion, a graph will be reproduced which will show the total work accomplished.

### A. Ricefields.

*Preparation of fields.* — This usually consists in ploughing and harrowing; the hoe is employed only to break the clods. In exceptional cases, ploughing and harrowing is replaced by hoeing. As a rule, the fields are ploughed over once and then, if enough water is available, they are flooded for a certain time. In this case hoeing is unnecessary and the subsequent harrowing requires little effort.

If the quantity of water available is not sufficient, the clods are broken by the hoe after ploughing. In this case repeated harrowings are necessary. When the ploughing is followed by a period of drought the other cultivation works must be postponed. After fresh rainfall the ploughing must be repeated followed by hoeing and harrowing.

Generally, the work of preparing the land must be repeated more than once, as in the majority of cases the quantity of water available for irrigation does not allow of ploughing and harrowing all the fields at one time. In addition it is essential to have ready, for the moment that the fields are ready for the transplanting work, a sufficient number of plants at the right stage of growth for transplanting. Very often the nurseries of a single owner cannot supply all the planting material necessary, and the cultivator must apply to other cultivators, and buy the plants he needs. For this he must have capital available at the right moment. Those engaged in this investigation noted that it is a great advantage to be able to purchase plants, as it is not desirable that the completion of the work of preparation of the soil should depend upon the state of the nurseries. If there is a certainty of obtaining plants at the right time, such work may be regulated in accordance with the degree of moisture of the soil, a factor depending on the rainfall, which varies in the different years.

*Varieties of rice grown.* — There is a large number of these varieties. Out of the 20 fields analysed, eight different varieties were planted; this is a good illustration of the way in which the Javanese understand how to make best use of the numerous varieties available. The rule is that each field is planted only with one variety, and mixture of kinds is avoided.

*Production.* — The crop of 1926-27 was more abundant than that of 1927-28, the low yield of 1927-28 is explained by the shortage of water at the period of transplantation. The following table shows the great diversity of yields between one parcel and another.

TABLE 2. — *Yields in quintals per hectare.*

Seasons	Average	Maximum	Minimum
1926-1927	43.6	70.5	20.1
1927-1928	26.3	36.5	9.3

During the season 1927-28, in which the rainfall was insufficient, it became evident that one of the two varieties (Dadoe) which were cultivated that season was able to withstand drought better than the other (Tjempo Sijem), as is shown by the following table.

TABLE 3. — *Yields of the two varieties of rice Tjempo Sijem and Dadoe in quintals per hectare.*

Variety	Number of fields observed	Average	Maximum	Minimum
Tjempo Sijem	10	24	31.5	17.5
Dadoe	8	31 *	36.5	26.8

\* This figure includes one field in which the harvest was a complete failure.

*Hours of work.* — The results of careful observations extending over a period of two years are shown in the following table :

TABLE 4. — *Number of working hours per hectare devoted to the cultivation of rice.*

Nature of Work	1926-1927				1927-1928			
	Men	Women	Children	Work Animals	Men	Women	Children	Work Animals
<i>A. Nurseries :</i>								
Ploughing	—	—	—	6	—	—	—	6
Harrowing	—	—	—	7	—	—	—	5
Hoeing	—	—	—	—	—	—	—	—
Sowing	13	—	—	—	42	—	—	—
<i>B. Fields :</i>								
Ploughing	—	—	—	63	—	—	—	61
Harrowing	—	—	—	57	—	—	—	53
Transplantation	7	281	9	—	—	252	26	—
Harvesting	169	469	76	—	112	512	64	—
Other work : hoeing, watering, weeding, protection against birds, etc.	319	80	4	—	414	157	17	—
Total . . .	508	810	89	133	568	921	107	125

The number of working hours is considerable, the greatest amount of labour being devoted to transplantation and harvesting. As already stated, however, the methods employed in these processes follow the old traditions and seem far from practical to the modern European.

*Financial results.* — Excellent in 1926-27 but less satisfactory in 1927-28. The following table shows the net returns per hectare.

TABLE 5. — *Returns per Hectare.*

Returns in florins :	20	21 to 40	41 to 60	61 to 80	81 to 100	101 to 120	121 to 140	141 to 160	160	Average
Number of farms which obtained returns shown in above columns										
1926-27 . . . . .	—	—	2	3	2	—	3	5	5	134 florins
1927-28 . . . . .	2	3	4	7	2	1	—	—	—	57 florins
Total number of farms :										
1926-27 : 20										
1927-28 : 19										

It is much to be regretted that the writers have not described the method by which they calculated the returns. Further information may be obtained from the other publications referred to above but this particular article gives no precise indication as to the profits which may be obtained by natives from rice cultivation.

#### B. "Polowidjo".

The food plants included under this name are cultivated in rotation with rice during the dry season.

*Preparation of the land.* — If the soil is not too damp after the rice harvest, the straw is cut and spread out to be burnt later ; it is sometimes taken to the village instead.

As soon as the soil begins to crack, about a week after the cutting of the straw the work of preparation of the land begins. Cultivators possessing work animals plough with the "budjul," a kind of plough which merely scratches the soil. Otherwise the "patjol," a kind of hoe, is employed.

Two ploughings are made, the second at right angles to the first. The furrows are traced by still a third ploughing.

After these operations, small holes are made in the ground with a setting-stick. If the soil proves to be too hard already, the hoe has to be used to scoop out pits in the earth, and then small holes for the seeds are made within these by means of the setting stick. Sometimes when the ground is exceptionally hard recourse is had to the marling spike.

The seeds are at once placed in the holes, which are filled with sand or ashes and village refuse.

*Food-plants grown.* — The number of different kinds grown is considerable. The investigators mention maize, sorghum, known as "tjantol" or "djagong padi" (*Andropogon sorghum* Brot), soybean, a kind of bean known as "katjang toongah" (*Vigna sinensis* Endl.), also different gourds such as the "semongko" (*Citrullus vulgaris* Schad.), two kinds of *Cucumis Melo* Linn., the loofah (*Luffa cylindrica* Roehm.), the "Waluk kolek" (*Cucurbita moschata* Duch.), the "Waluk djanggar" (*Lagenaria leucantha* Rusbg.), plants which are admirably adapted to drought. A large area is covered with maize.

*Production.* — Figures are only available as regards the maize crop of 1928. The harvest was a good one, the average yield being 33 quintals per hectare with a maximum of 51 quintals and a minimum of 14.5 quintals.

The first crop to be harvested is that of the "krai", one of the two kinds of *Cucumis Melo*, which is gathered at the beginning of August. Later in the same



It is clear that there are three periods of intensive labour : 1. from December to February, the work for preparing the rice fields, sowing and transplanting of the rice ; 2. from April to May, the period of the rice harvest ; 3. from June to October, planting and harvesting of the " polowidjo " crops, the different operations following closely on each other without any break.

In addition it will be seen that the work animals are employed only during certain weeks, for ploughing and harrowing of the ricefields and the land under " polowidjo ", *viz.*, during December to February and June to August.

For three or four months in all farming work is suspended. Two rest periods may be distinguished : one in November and December and the other in March and April.

#### IV. — CONCLUSIONS.

The above summary of the investigation made by MM. VINK, DJODJOHARDJO and ISKANDAR illustrates the procedure followed in this particular analysis, but general conclusions cannot be drawn. If one of the other investigations mentioned had been studied, it would have been observed that the results of the enquiries differ considerably. For example, the figures differ according as to whether they relate to combinations of food crops or of industrial crops. It will be enough to mention the published analysis of de VRIES, ALERS, and SOEPARJO WIMOTO ATMODOJO, in which it appears that the net return from one hectare of tobacco may be as much as 495 florins, while the same field in rice will give a return of only 70 florins. These figures make obvious the considerable effect on the economic life of a village due to the introduction of an industrial crop.

Although Java is among those tropical countries in which the study of rural native economy has been pursued with peculiar thoroughness, all that has been done up to the present serves merely to open the way to further investigation.

Fundamentally, the economy of Asiatic populations remains an enigma for Europeans. It may seem desirable to introduce farm machines to effect saving of the hours of human toil, but it is doubtful whether such a measure would be acceptable to the people themselves. In the course of the discussion which followed the paper read by de VRIES in December 1930, the following anecdote, taken from an article by F. OTTE, illustrating the mentality of these peoples, was quoted by SCHELTEMA. OTTE was looking on while an old man was splitting wood with a primitive type of knife ; after watching him for an hour, he asked a Chinese friend : " Why does he not use a hatchet ? His friend, an intelligent Cantonese, replied in fluent English : " He would work too fast and would have nothing to do thereafter. " On another occasion, OTTE asked the same friend why the native farmer did not use a windmill to pump water on to his ricefields. The reply was : " His son can do it with a treadmill. Why should he buy a machine and feed his son into the bargain ? "

It is undoubtedly essential to take into account a mentality so different from the European, partly arising from the over population of certain countries, such as India, Java and China. It is one of the factors that render difficult and even at times quite impossible the comparison of European and American farms or farm holdings with those of the Asiatic countries.

Once this fundamental difference has been fully grasped, it is seen that the problems assume a totally different form in Asia and Europe, and every care must be taken not to draw premature conclusions.

Another question arises — can the methods practised in Java be applied in



Africa? It will be remembered that the last meeting of the Bureau of the Commission for Agriculture in Tropical and Subtropical Countries of the International Scientific Council dealt exclusively with the rural economy of the African peoples. In our opinion no comparison is possible. The economic problems are entirely different for people with shifting agricultural practices and those carrying on established types of cultivation. In consequence the forms of enquiry used in Java would not elicit the exact information required as to the economic conditions of the African natives. From what has been shown above, it may be seen that even in Java the economic conditions are so diverse that it is not easy to prepare questionnaires suitable for all and each. It is clearly impracticable to draw up a schedule of questions adapted to the varying conditions of tropical agriculture as practised by different races of mankind.

W. BALLY.

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## INSURANCE

### Hail Insurance in Poland. \*

The nine national institutions undertaking hail insurance in Poland under State control were in 1930 as shown below :

#### A. Limited liability companies :

1. *Towarzystwo Ubezpieczeń "Orzeł w Warszawie"*, at Warsaw with a share capital of 1,200,000 zlotys ;
2. *Towarzystwo Ubezpieczeń "Pół"*, at Warsaw with a capital of one million zlotys ;
3. *Warszawskie Towarzystwo Ubezpieczeń*, at Warsaw with a capital of three million zlotys .

#### B. Mutual insurance societies :

\* The above note is mainly based on the data and material communicated by the Minister of Agriculture for Poland and by the General Institute of Mutual Insurance at Warsaw in reply to a questionnaire addressed them by the Bureau of Economic and Social Studies of the Institute.

1. *Krakowskie Towarzystwo Wzajemnych Ubezpieczeń* at Cracow with a reserve fund of 32,849 zlotys ;

2. *Towarzystwo Wzajemnych Ubezpieczeń "Sноп"* at Warsaw with a reserve fund of 110.294 zlotys ;

3. *Towarzystwo Wzajemnych Ubezpieczeń od Ognia i Gradobicia "Vesta"* at Poznań with a reserve fund of 937,401 zlotys.

C. *Semi-official societies :*

1. *Krajowe Ubezpieczenie Ogniove w Poznaniu* at Poznań with a reserve fund of 622,214 zlotys ;

2. *Powszechny Zakład Ubezpieczeń Wzajemnych* at Warsaw with a reserve fund of 12,190 zlotys and a borrowed capital of 600,000 zlotys ;

3. *Pomorskie Stowarzyszenie Ubezpieczeń* at Toruń with a reserve fund of 175,547 zlotys.

While the capital of the limited liability companies enumerated above is available for all the branches of insurance with which these companies deal, the reserve funds belonging to the other societies are available for the hail insurance section only of the respective societies.

Hardly any of the above societies were in existence before the war.

The Warsaw society "*Ceres*" for mutual insurance against hail (*Towarzystwo Wzajemnego Ubezpieczenia od Gradobicia "Ceres"*) which was in existence before the war and engaged only in hail insurance was seriously affected by the crisis following on the war and the monetary inflation and was consequently obliged to amalgamate in 1923 with the Warsaw mutual insurance society "*Sноп*" (*Towarzystwo Ubezpieczeń Wzajemnych "Sноп"*).

The nine societies shown above with activities including hail insurance have formed an Association of Insurance Companies (*Zrzeszenie Towarzystw Ubezpieczeń*). The objects of this Association are as follows : 1. the unification of premium rates and additional charges for all members of the association ; 2. the unification of brokerage charges ; 3. the preparation of joint statistics ; 4. regularisation of the collection of premiums ; 5. unification of the conditions of hail insurance ; 6. unification of the methods of estimating losses from hail.

The practical results obtained by co-operation within the limits of the Association are of great importance and in full accordance with the objects and development of this type of insurance.

The work effected has been as follows : (a) general model conditions of hail insurance have been laid down and appear likely to be accepted in the near future by all insurance companies ; (b) collaboration has been established with the Meteorological Institute and the results embodied in an important publication towards the appearance of which grants have been made by two semi-official insurance societies ; (c) the method of fixing the scale of compulsory premiums has been systematised for all the companies which form part of the Association ; by this means a fair calculation of the premiums is ensured and the application of lower rates — within reasonable and prudent limits — is rendered possible ; (d) taking into account the serious bar to the development of hail insurance resulting from the fact that the high percentage of losses necessitates as a rule the application of high premium rates, the Association has instituted a Committee for the settlement of claims for hail damage, consisting of the heads of the corresponding departments in all the associated companies.

The work of this Committee included : (a) the raising of the level of training of the experts making surveys of losses from hail ; (b) unification of scientific methods of assessment of losses ; (c) establishment of technical rules for a uniform

assessment of losses from hail with their publication in handbooks ; (d) the practical application of results obtained by means of investigational work ; (e) examination and if necessary revision of the reports of the hail experts.

The Committee bases its enquiries especially on mechanical damage done to crops and on an estimation of the normal yield which would have been expected. The investigations have been pursued for the last three years, at the suggestion of the Association, by the University of Cracow and by the agricultural station at Koscielce.

The results thus obtained have been very important in respect to precision in the assessment of losses and uniformity in the methods adopted by private insurance societies.

Polish legislation on the insurance contract is still far from being unified. In the territories formerly under Russian domination there were no special laws relating to the insurance contract. The Minister of Internal Affairs had the power to approve agreements of the kind and also to enact regulations on the subject. In the territories formerly under German and Austrian rule, the original laws had remained in force.

Provisional legislative measures have been enacted by a Decree of the President of the Republic dated 24 February 1928 relating to insurance contracts. A law on the subject has been under consideration for several years, but it appears that the definitive drafting of such a law is postponed.

Inspection or supervision of insurance societies was instituted in Poland on 26 January 1928 by a Decree of the President of the Republic. This law is divided into six parts and contains 135 articles. The first part deals with private insurance societies (limited companies, national co-operative associations and foreign companies) ; the second deals with semi-official societies ; the third with the authorities responsible for the supervisory work ; the fourth with penalties ; the fifth and sixth with temporary provisions.

Federal supervision of insurance companies is exercised by State institutions, and particularly by the State Bureau for Control of Insurances. A yearbook containing data of a general nature and statements regarding the financial position of all insurance companies in Poland, is published annually, partly in French, by this Bureau.

In connection with this supervisory body there is an Insurance Council composed of 12 members and having advisory powers. The expenses of supervision are covered by a levy made on the insurance companies.

On 31 January 1929 a decree was issued by the Ministries of Finance, of the Interior and of Agriculture by which insurance was made compulsory for the following categories : (a) insurance against fire of agricultural chattel property such as grain, fodder, etc., of the farm livestock and, finally, of farm implements, etc. ; (b) livestock insurance ; (c) hail-insurance. By this decree the independent administrations of districts (*Kreis Dietinen*) are empowered to establish within their respective territories compulsory fire insurance for agricultural chattel property and compulsory livestock insurance, while the same right has been conferred as regards hail insurance on the independent administrations of voivodies within the limits of their respective territories. These compulsory insurances are to be effected with the General Mutual Insurance Society (*Powszechny Zakład Ubezpieczeń Wzajemnych*) for the territory over which its activities extend, while as regards other districts insurances will be effected either by the existing semi-official institutions or by others established for this purpose.

Fire insurance for agricultural chattel property was gradually established and in

1929 it existed in 27 territorial districts. In these districts insurances are effected through the General Society mentioned.

Up to 1929 the other classes of compulsory insurance (livestock and hail) had not been introduced into any part of Poland.

Two organisations deal with the question of hail from the meteorological standpoint, namely the Central Meteorological Institute of Poland and the Association of Insurance Companies which effect hail insurance in Poland.

The Central Meteorological Institute until last year had no system for issue of scientific publications but has now established for the purpose a yearly publication which contains in its first issue an article by M. Guminski on hail during 1930 in Poland. This article is of great interest and consists of three chapters dealing with : (a) hail, causes and attempts to control ; (b) observations on hail in Poland ; (c) notes on the observations made in 1930. Tables follow showing : (a) the localities where hail was noted during 1930 ; (b) the occurrence of hail in the separate months of 1930 ; (c) statistics in regard to fall of hail arranged by voivodies ; (d) extent of the damage caused by hail during 1930 ; (e) totals of sums assured and of compensation payments in respect of hail during 1930. This last table is arranged according to the districts. The work is completed by 24 graphs corresponding to the tables indicated.

The quotation that follows from this article is of interest as illustrating the activities of the Meteorological Institute in respect of the question of hail.

Up to 1920 hail observations were chiefly made in Poland by the system of meteorological stations in existence, but since 1924 data on hail have also been collected by farmers in correspondence with the State Central Statistical Bureau. The meteorological stations report on hail either in the monthly statements along with other meteorological observations or separately on special sheets. The farmers in correspondence with the Bureau note the occurrence of hail on the questionnaires by which agricultural statistics are collected. All the material collected at the Meteorological Institute since 1920 has been checked as far as possible and classified according to voivodies and districts. Monthly charts were prepared, moreover, showing the distribution of hail over the surface of Poland, the entire series being afterwards published by Prof. A. B. Dobrowolski under the title of " Information regarding hail in Poland (1926-27-28) ".

With the collaboration of the insurance societies operating in Poland, the Meteorological Institute has developed a very satisfactory system of hail observations. In 1930 observers and correspondents supplied material to the Meteorological Institute in the form of replies to a questionnaire under the following 14 heads :

1. Date of the hail-storm.
2. Hour of the hail-storm.
3. Duration of the hail-storm (did the hail fall intermittently) ?
4. Information as to the approximate size of the hail-stones (vetch seed, pea, hazel-nut, walnut, pigeon's egg, etc.).
5. Shape of the hail-stones (i. e., round, oblong, etc.).
6. Structure of the nucleus of the hail-stone.
7. Did the hail fall thickly or was it thinly scattered only ?
8. On which quarter of the horizon did the hail clouds appear ?
9. Which direction did the clouds take after the fall of the hail ?
10. Was the hail accompanied by a storm ?
11. Direction and force of the wind which accompanied the hail (Beaufort scale).
12. Length of the region affected by the hail.
13. Breadth of the region affected by the hail.
14. Losses caused by the hail (in percentage of the harvest) :

- (a) cereals ;
- (b) root crops.
- (c) orchards.

Some 8,300 observation posts were arranged for in connection with the above questionnaire.

During 1930 more than 2,000 schedules were filled in and returned to the Meteorological Institute.

The Report above referred to observes that the material collected is not of uniform quality ; that some points are overlooked ; that a certain class of correspondents show a tendency to exaggerate the importance of the losses caused by hail. It adds, however, that the observations, taken as a whole, are adequate for the practical purposes of such statistics.

The material supplied by the Association of Insurance Companies relates only to the areas where hail insurance has been introduced. It is mainly on the basis of these statistics that a systematic rating in accordance with districts has been established.

The following table is taken from the Year Book of the State Office of Inspection of insurances and shows the premiums paid and the claims dealt with during 1929 by the societies coming under the inspection of this Office :

	Premiums	Claims paid
	on direct insurances (in zlotys)	
<i>Limited Companies :</i>		
"Orzeł" . . . . .	430,345	387,196
"Port" . . . . .	270,750	251,983
Warszawskie Towarzystwo Ubezpieczeń . . . . .	1,386,009	2,296,312
<i>Mutual Insurance societies :</i>		
Krakowskie Towarzystwo Wzajemnych Ubezpieczeń . . . . .	1,260,014	1,287,333
"Snop" . . . . .	3,196,057	3,160,290
"Vesta" . . . . .	3,322,684	5,932,233
<i>Semi-official societies :</i>		
Krajowe Ubezpieczenie Ogniove w Poznaniu . . . . .	1,288,593	2,251,208
Powszechny Zakład Ubezpieczeń Wzajemnych . . . . .	1,002,481	1,029,060
Pomorskie Stowarzyszenie Ubezpieczeń . . . . .	131,936	107,060
	12,228,877	16,703,060

The number of policies taken out and the sums assured in 1929 by the same societies appear from the following table also taken from the Year Book of the State Office :

	Policies	Sums assured
	in zlotys	
<i>Limited Companies :</i>		
"Orzeł" . . . . .	1,845	15,066,370
"Port" . . . . .	1,115	20,491,094
Warszawskie Towarzystwo Ubezpieczeń . . . . .	2,413	85,157,752
<i>Mutual Insurance Societies :</i>		
Krakowskie Towarzystwo Wzajemnych Ubezpieczeń . . . . .	4,355	57,485,006
"Snop" . . . . .	5,166	191,159,470
"Vesta" . . . . .	24,346	221,898,193
<i>Semi-official societies :</i>		
Krajowe Ubezpieczenie Ogniove w Poznaniu . . . . .	6,189	78,600,484
Powszechny Zakład Ubezpieczeń Wzajemnych . . . . .	13,532	64,826,384
Pomorskie Stowarzyszenie Ubezpieczeń . . . . .	468	7,813,504
	59,378	748,188,816

It seems desirable to give the figures for 1926, 1927, and 1928 relating to the premiums paid and the claims paid for societies under the control of the State Office. These figures have been taken from the *Assekuranz-Jahrbuch*, Nos. 47, 48, 49. Figures are shown in thousands of zlotys.

	1926		1927		1928	
	Premiums	Claims paid	Premiums	Claims paid	Premiums	Claims paid
<i>Limited companies :</i>						
« Orzel » . . . . .	213	156	238	524	345	246
« Port » . . . . .	16	8	153	253	216	176
Warszawskie Tow. Ubez . . . . .	743	630	1173	1803	1440	1179
<i>Mutual Insurance Sociétés :</i>						
Krakowskie Tow. Wzaj. Ub. . . . .	533	324	1092	2082	1389	1232
Towarzystwo Wzaj. « Snop » . . . . .	1360	1146	2161	3676	3876	2911
« Vesta » . . . . .	2020	1054	3885	4766	4068	3627
<i>Semi-official Societies :</i>						
Krajowe Ubez. Ogniove . . . . .	760	717	940	1214	1064	1365
Powozeczny Zakład Ubez . . . . .	914	273	1098	1504	1314	861
Pomorskie Stow. Ubez . . . . .	—	—	75	62	116	78

In regard to hail reinsurance, the following table contains statistical data taken from the Year Book of the State Bureau for Control of Insurances and relating to the sums reassured in 1929 by the societies indicated, as well as the premiums allowed to the reinsurance companies and the amounts indicating the extent to which these companies take part in the settlement of claims.

	Sums reassured zlotys	Premium granted to reinsurance companies zlotys	Extent to which reinsurance companies take part in settlement of claims zlotys
<i>Limited Companies :</i>			
« Orzel » . . . . .	14,099,733	387,311	348,476
« Port » . . . . .	18,441,981	243,682	226,784
Warszawskie . . . . .	63,868,314	1,035,778	1,729,250
<i>Mutual Insurance Societies :</i>			
Krakowskie . . . . .	51,737,046	1,134,012	(2) 1,211,364
« Snop » . . . . .	171,087,730	2,860,470	(2) 3,588,846
« Vesta » . . . . .	221,898,193	1,917,994	(2) 3,850,639
<i>Semi-official Societies :</i>			
Krajowe . . . . .	55,083,338	905,915	1,575,781
Poszeczny . . . . .	38,805,800	618,360	624,170
Pomorskie . . . . .	6,851,478	112,159	85,054

(2) Including amounts representing extent of participation in claims reserved for settlement.

## CO-OPERATION

### Co-operative Organisation in the United States of Mexico.

#### (a) Legislation regulating Co-operation.

The development of co-operation in Mexico dates from 1920. It was a consequence of the fundamental revolutionary changes that came about in that country in 1913 and was among the points included in the new agrarian programme

established by that revolution. There was however an absence of competent direction during the early stages of that movement, as well as a tendency for the new campaign in favour of co-operation to be used rather as a plank in the political platform than in the true interests of the agriculturists. Hence no immediate practical result was seen from the first measures relating to co-operation enacted by the Federal Government, namely, the law on agricultural credit of 2 March 1926, and the law of 10 April of the same year on agricultural banks described as *ejidales* (1) relating to banks intended for the financing of co-operation.

As membership of co-operative organisations depending for their credit supplies on the *Bancos Agrícolas Ejidales* and on the National Bank of Agricultural Credit was limited to *ejidatarios* (2), or members of the agrarian communities known as *ejidos*, the great mass of small farmers including the *rancheros* or share-tenants, who undoubtedly formed, to the extent of their modest resources, the nucleus of Mexican agriculture, were left without the protection which the law extended to the *ejidatarios* only. The ordinary small holders were thus at a disadvantage, since, if grouped in co-operative societies, they were without effective representation and influence, and in addition, owing to absence of resources, were obliged to surrender the greater part of their profits, if not to the money lender, to the landowner from whom their farms were held on a produce sharing or a rent paying basis.

It thus became essential to make provision for the protection of co-operation in all its forms and to assist all agricultural interests without distinction of groupings. Accordingly a general law regulating co-operative societies was enacted on 10 February 1927 with a view to solving a situation which was becoming increasingly difficult. This law, together with earlier laws constituting the National Bank of Agricultural Credit and the *Bancos Agrícolas Ejidales*, form all the legislation in force up to the end of 1930 on the subject of agricultural co-operation. Later, in view of the comparative inactivity of these latter banks, and also with the view of unifying all activities — since the work of the National Bank and those of the special agricultural banks covered the same ground — a new law on co-operative societies was passed on 21 January 1931.

By the law of 1931 the *Bancos Agrícolas Ejidales*, or banks supplying credit to the special agrarian communities known as *ejidos*, pass under and become subordinate to the National Bank of Agricultural Credit, and for the future are no longer so designated but are instead known as regional banks of agricultural credit (*Bancos Regionales de Crédito*). All the co-operative societies, which in future will be called agricultural co-operative societies (*Sociedades Cooperativas Agrícolas*), will depend for their credit supplies on these banks. The pivot of the new co-operative structure will be the National Bank of Agricultural Credit the function of which will be to organise, regulate and supervise the regional banks, granting them every kind of credit facility for the development of their operations. These Regional Banks form the second stage in the organisation and are in direct contact with the agricultural co-operative societies which form the lowest stage. The Banks promote the formation of these co-operative societies, supply them with the credit they require and give assistance in their various activities so as to give an impetus to co-operative progress.

The new law extends its benefits to the small holders who have been till now

(1) *Ejido* is the designation given to the lands in common ownership of the inhabitants of a single commune, such lands being usually contained within the boundaries of the commune.

(2) *Ejidatario*, member of an *ejido*.



neglected and left to depend upon the money lender for resources, and in this way the distinction has been broken down between the protected *ejidatario* and the unprotected *ranchero*.

### (b) *Agricultural Co-operative Societies.*

The Agricultural Credit law of 21 January 1931, as shown by its title, deals with the problem of the credit to be made available for Mexican agriculture. A full account has already appeared in this Review (1), but in this article, which is an attempt to describe the present position of agricultural co-operation in Mexico, some further attention may well be given to Chapter III of this law in which are stated the general principles for the conduct of the co-operative societies.

By the term "agricultural co-operative societies", is understood societies organised on the basis of unlimited joint and several liability by the members of a special agrarian community (*ejidatarios*), or by small farmers, in accordance with the regulations of the law.

The credit required for the societies or for their members is obtained by the societies from the Regional Bank of the area, or if non-existent from the agency appointed for the purpose.

Such credits can only be employed for the objects approved by the Bank when granting the loan. These objects usually include organisation of the arable or livestock farming, forest or other industry of the *ejido*, farm settlement or locality in which any society functions; the purchase of seeds, breeding animals, implements, fertilisers, machines, etc.; land drainage or land improvement works; establishment of general warehouses, undertakings for the transformation of agricultural, livestock or forest products, or undertakings for the joint sale of these products; also setting up of stores for supply of the rural household, etc.

The co-operative societies may act as agents for the collection, transport and realisation of the members' products, and as representative of the members for the regulation of all fiscal or administrative questions which may arise between the members and the authorities of the township, the State or the Federal Government provided such questions relate to farming. Societies may take steps to bring under cultivation common lands belonging either to *ejidatarios*, or to small farmers. Among their principal functions is the encouragement of the economic organisation and of the moral and social progress of the members, as well as the raising of the standard of living in the rural household.

All members of a co-operative society must be of Mexican nationality; provided this condition is satisfied membership is open equally to cultivators having the status of *ejidatarios* and to small farmers. As regards the former, these members of the special agrarian communities may form a co-operative society only when the legally prescribed formalities have been observed and provided that the regional bank of the area in question has authorised the formation of such a society. As regards the small farmers, for the purposes of a co-operative association all persons are considered as such who habitually engage in the work of cultivating or otherwise utilising the soil, whether as owners, concessionaries, settlers, rent-paying or produce-sharing tenants; provided only that all such work is carried out by them personally with the assistance of their family or with outside help — not more

(1) See No. 7 of year 1931, p. 271.

than five persons outside the family to be engaged — and that the area of the farm does not exceed that fixed by the agrarian laws as the maximum for the small holding. The co-operative societies of these small farmers should be formed by the rural dwellers of one and the same locality possessing similar interests, and farms and crops of a similar type, and with personal knowledge of each other, all factors tending to ensure harmony and co-operation.

In reference to the number of members essential for the formation of a co-operative society, the societies of members of agrarian communities (*ejidatarios*) must include the majority of the members of the community in which it is intended to form a society; societies of small farmers cannot be formed with less than ten members. If this number cannot be reached, then the small farmers may join the co-operative society of an agrarian community (*ejido*) but have no rights in the common lands nor can they exercise the rights of a majority.

In every agricultural co-operative society a special fund will be formed from the proceeds of the profits supplemented by a percentage of two per cent. on the total of the loans made by the society to its members, and in addition by another two per cent. of the gross returns.

In the case of the co-operative societies formed by *ejidatarios* this reserve fund will be increased by all the proceeds of the common farming of the lands of the *ejido*.

The administrative and supervisory bodies of the co-operative societies are as follows: the general meeting of the members, the Management Council, the Committee of supervision, the manager and the District Head who is at the same time treasurer. The general meeting is the supreme authority, each member having one vote; ordinary meetings are held every two months and an extraordinary meeting can also be summoned at the request of the District Head, the Management Council, the Committee of Supervision, or of, at least, 20 per cent. of the members.

The Management Council directs the business of the society in accordance with the instructions received from the general meeting, submitting a report on the management yearly to that body. The number of members forming the Management Council will be fixed by the rules of the society such number not to be less than three or more than nine. The election of members of the council will be by a majority of votes, and on expiration of their term of office members must be re-elected.

The Committee of Supervision represents the minority party in the society; it consists of three members elected by the minority at the time of the nomination of the Management Council. The duty of this Committee is to see that the society observes its commitments, that its operations are in accordance with the provisions of the law and with the rules of the society that the funds are properly invested; in short its function is to see that the society is properly managed. For this purpose, the members of this Committee are entitled to inspect, without restriction of any kind, all classes of documents, books and papers of the society. The services of members of the Committee and of the Council are unpaid, and some form of emolument is distributed only when the society is making good progress and provided that the bank on which it depends approves.

The manager is appointed each year by the Management Council and his powers and functions are those corresponding to this position in limited liability companies, with restrictions or extensions as prescribed by the rules of each co-operative society.

The cash of the societies, the care of their funds and securities, as well as the carrying out of the credit operations, are all, while subject to the direction of the Manager, in the hands of the District Head Treasurer, who is appointed by the National

Bank of Agricultural Credit on the proposal of the Regional Bank on which the society depends.

In accordance with the law, a deduction of 25 per cent. is made on all profits for payment into the provident fund of the society; another 25 per cent. is employed to increase the reserve fund referred to earlier and the remainder will be handed over to the Department of Peasant Savings (*Departamento de Ahorros del Campesino*), so that there may be credited to each of the members the amount due to him in the proportion of the business done by each during the financial year.

The Department of Peasant Savings (*Departamento de Ahorros del Campesino*) should receive a brief mention on account of the relations existing between it and the co-operative societies; and also because it was brought into existence by the same law of 21 January 1931 and is an outstanding example of the trend of modern agricultural financial legislation. It has been formed as a department of the National Bank of Agricultural Credit with a view to the encouragement of the habit of thrift among the rural population of the Republic of Mexico. Although a section of the Bank it is independent. Deposits entrusted to it must be invested in loan operations under guarantee of pledge warrants (*bonos de prenda*) issued by warehouses; such deposits will bear interest at three per cent. and are not liable to legal sequestration or distraint. Depositors of savings will have the right to withdraw funds on the following conditions: up to 25 pesos, on sight; more than 25 but not exceeding 50 pesos, with a fortnight's notice; sums exceeding 50 pesos, with a month's notice. If however the depositors are members of a co-operative society, they may withdraw any proportion of their deposit without previous notice provided that the sums required are intended for the needs of their farms.

Returning to the agricultural co-operative societies, the law enacts that dissolution and liquidation shall take place in accordance with the terms of their constitution, provided that the financing bank authorises dissolution. The liability of the members continues for one year after their withdrawal from the society. In the event of dissolution or liquidation, the amounts corresponding to the reserve and to the provident fund will not be available for distribution among the members, and the assets will in the first case be used to cover the debts contracted by the society. Any remainder there may be will be paid into the Regional Bank concerned and will be devoted to the following purposes:

1) If within one year of the date of the dissolution of the society, another is formed including the majority of the members of the earlier society, then these remaining funds will be handed over to the new society;

2) if this condition is not fulfilled, the funds will be applied to the payment of premiums on insurances against losses from plant diseases, live stock epidemics, hail, or other losses of crops or live stock; to the establishment and upkeep of provident institutions for the benefit of farmers, pensions for old or disabled cultivators or similar purposes.

The Law of 21 January 1931 also authorises, with a view to the regulation of the storage, of agricultural products, the establishment of co-operative warehouses for such products, whether already transformed or not. These warehouses will have a local character and will belong to the co-operative societies, but their use must be authorised by the Regional Bank of the area concerned. They will be empowered to issue warrants which will be negotiable only if they bear the Bank guarantee.

According to the law the co-operative societies may undertake the following activities: credit, production, labour, insurance, building, transport, joint sale, joint purchase and a combination of two or more of the activities indicated.

The law allows the formation of Unions of co-operative societies or federations,

described in the law as co-operative societies composed of co-operative societies (*Sociedades cooperativas integradas por cooperativas*). These are recognised as organisations next in order to the local societies and as carrying on similar activities.

(c) *Present Position and Probable Future of Co-operation.*

At the present time the co-operative movement has prospered when it has been possible to obtain the necessary credit for organisation, as is the case with the societies depending on the National Bank of Agricultural Credit and the Regional Banks ; on the other hand when the attempt has been to rely on internal resources only, success has not followed except within very narrow limits. This poor result has been largely due to want of preparation of the agricultural environment and to the inexperience of the persons who at the outset directed the movement. It is however noticeable that in the present situation of Mexico as affected by the world economic crisis the farmer is impelled to seek refuge in co-operation, the proof of this being the rapid increase in the number of requests from the different regions for official instructions in respect of co-operative organisation.

The Secretariate of Agriculture supplies the following data in respect to the number of co-operative societies organised and on their distribution at the present time over the territory of the Republic.

Lower California/ . . . . .	5	Nayarit . . . . .	2
Campeche . . . . .	1	Nuevo Leon . . . . .	1
Coahuila . . . . .	1	Oaxaca . . . . .	4
Chiapas . . . . .	4	Puebla . . . . .	24
Chihuahua . . . . .	4	Quintana Roo . . . . .	2
Federal District . . . . .	3	San Luis Potosí . . . . .	1
Durango . . . . .	7	Sinaloa . . . . .	1
Guanajuato . . . . .	3	Sonora . . . . .	1
Guerrero . . . . .	3	Tabasco . . . . .	2
Hidalgo . . . . .	2	Tamaulipas . . . . .	5
México . . . . .	8	Veracruz . . . . .	33
Michoacan . . . . .	5	Yucatán . . . . .	2
Morelos . . . . .	1		

The greater number of these are agricultural production societies, some but fewer are stockbreeding societies and a much smaller number are societies for industrial transformation ; the main activity is production and the subsidiary activities are joint sale, joint purchase and sale, and credit. There is only one co-operative labour society.

Considering within how short a time agricultural co-operation has been organised in Mexico, it is in no way surprising that the movement is not further advanced at the present time. On the other hand, if comparisons are to be made, it will be seen that an extremely satisfactory result has been obtained by introducing a system which, while it has found congenial soil for development in the revolutionary conceptions that prevail in the country, yet has not had the effect of constituting a radical innovation in the customs and methods that have been in force over a long period of years.

Practical experience will result in improvement, and this consideration, joined with the growth of special institutions for instruction in co-operation, and the increasing stability and adequacy of the co-operative system in Mexico, forms an inducement to believe that co-operation will make great progress in Mexican agriculture for the benefit of all interests. The country depends on its own resources, and at the present time what is needed in order to utilise these is an intensive co-operative education, the training of expert managers and a legislation wide from all points of view. Since all these factors are coming into play, it is to be hoped that within a short time the Republic may be able to count on the prosperous system of co-operation that its efforts have merited.

M. B.

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## MISCELLANEOUS

### Some Economic Problems of Tropical Agriculture.

The problems of tropical agriculture and administration are becoming increasingly recognised as important factors in world agricultural economics, and for this reason considerable interest attaches to a Conference of Directors of Agriculture in the British Colonies held from the 14 to the 17 of July 1931 in London.

It will be seen that, as nearly all of the British colonies and protectorates lie within the tropics, with an aggregate land area of approximately 2,600,000 square miles (or about 670 million ha.) and include a great variety of races in their populations, the body of opinion obtained by means of this Conference on the problems of tropical agriculture and administration may be regarded as possessing much of general interest and value.

Among the subjects included in the agenda were the following: training of agricultural officers; training of locally recruited officers, other than European, for the subordinate services in agricultural departments; functions of local advisory agricultural bodies; produce inspection and grading; co-operation; agricultural education; control of crop pests and diseases; methods of field experimentation; district registers; animal husbandry in relation to agriculture.

It is proposed to summarise briefly here the course of the discussions and the resolutions adopted, with special reference to their bearing on economic questions.

The discussion relating to the position assigned to *co-operation* in the activities of Departments of Agriculture in the countries represented at the Conference was of outstanding interest. The memoranda received were reviewed, and it was evident from these as well as from the observations of the speakers that the stages of progress in respect of agricultural co-operation varied greatly in the different areas, while there was also considerable variety in the character of co-operative activities. On the whole, co-operative marketing is well developed throughout the West Indies, and in the Gold Coast, Uganda and elsewhere, is making good progress among native growers. In the Federated Malay States and Straits Settlements a separate Government Department of Co-operation has been formed, and progress has been made in organising agricultural credit and the marketing of agricultural products, although the development of marketing and the more advanced forms of co-operative enterprise is rendered difficult in these areas by the absence of business ability among the growers.

The points that emerged in the course of the discussion may be briefly summarised thus: it was generally held that, whether or not agricultural co-operative credit and co-operative marketing should either or both properly come under the organisation of a Department of Agriculture, in any case these forms of co-operation have their place as methods of possible solution of the problems relating to disposal of agricultural produce and financing of farming operations, and consequently agricultural co-operation should be among the subjects to be studied by Departments of Agriculture. These Departments should moreover undertake the general study of the economic and domestic conditions of any particular region in view of the application of such remedial measures as may be necessary or applicable.

The resolution of the Conference on the subject of co-operation is given *verbatim* as possessing special interest. "The Conference desires to record the view that an integral part of the duties of Colonial Governments towards agriculture should be to supervise and assist in the supply of seed, fertilisers, implements, etc. to small holders, the inspection, grading and disposal of their produce, and the financing of their operations, either by means of co-operation or otherwise, and that if adequate provision is not made in this respect, the work and expenditure of Departments of Agriculture may tend to be wholly or partially ineffective.

"There is definite need for officers in Departments of Agriculture with specialised knowledge and training in agricultural co-operation and economics.

"Agricultural Departments have definite duties towards the improvement of the preparation and disposal of agricultural products through co-operative organisations, and considers that, where necessary, special branches should be organised for the supervision and guidance of co-operative societies which are not exclusively for thrift and credit".

The importance of *produce grading and inspection*, both for improvement of quality and also for the economic welfare of the producers was abundantly clear from the whole course of the discussion. Detailed reports submitted by the authorities in Nigeria, Kenya and Jamaica in particular made evident the satisfactory results of the institution of these services, in respect of the principal products of the respective territories. It was agreed that costs of grading and inspection should be borne by the industry concerned by means of a cess or levy, although in the initial stages of any such scheme from public funds some assistance towards capital expenditure and the inauguration of the service may be justified. Contact with the trade should be maintained through Advisory Committees. The Higher inspecting staff should form a section of the Agricultural Department, while the subordinate staff should be engaged on terms equivalent to those prevailing in

commercial business with salary increments depending on good and efficient work.

The issue of certificates of grade, while essential under certain conditions, was considered to be a matter properly left for decision as regards the separate products by the responsible officials.

In view of the great importance attached to the inspection of produce and grading, the Conference recommended that the Empire Marketing Board should be requested to make a comprehensive survey of the systems in force throughout the British Empire for agricultural products, with a summary of the conclusions to be drawn on the subject.

The place of *animal husbandry in relation to agriculture* was the subject of several detailed memoranda and was very fully discussed by the Conference in conjunction with the Adviser on Animal Health to the Colonial Office. Recently considerable attention has been given to mixed farming in certain tropical and sub-tropical areas, notably in Nigeria, Kenya and Northern Rhodesia, with good results, but experience has shown that development of animal husbandry is bound up with questions of pasture management and feeding problems so that any policy in regard to it must be decided locally in accordance with the conditions of the country.

The resolution passed by the Conference accordingly stressed in general terms the increasing importance of mixed farming in agricultural development in the colonies, stating that the maintenance of live stock on holdings is essential for the preservation of soil fertility. It was further the opinion of the Conference that work on animal husbandry cannot normally be separated from the operations of Agricultural Departments.

C. H.

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## OF

### AGRICULTURAL ECONOMICS AND SOCIOLOGY

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#### LAND SYSTEMS

#### The Agrarian Reform in Estonia from 1919 to 1930. (1)

##### I. — INTRODUCTION.

The Estonian Republic is situated on the eastern coast of the Baltic Sea, and is bounded on the north by the Gulf of Finland, on the east by the U.S.S.R., on the south by Latvia, and on the west by the Baltic Sea.

The territorial area of Estonia is 47,546.70 square kilometres. Of the total area 3,719,144 hectares consist of agricultural productive land and 1,035,726 hectares consist of unproductive lands and inland waters.

Of lands capable of cultivation 1,046,996 are arable lands, 1,796,020 are natural grasslands and pastures and 898,279 hectares are forest land.

The arable fields were in 1930 cultivated as follows :

Cereals and leguminous crops . . . . .	518,809 ha.
Grass . . . . .	206,305 »
Root crops . . . . .	76,112 »
Flax . . . . .	32,547 »
Fallow . . . . .	187,954 »
Horticultural and other field crops . . . . .	25,296 »
Total . . . . .	1,046,996 ha.

According to the results of the 1922 census the population of Estonia was 1,107,059, those inhabiting the large towns and small market towns numbering 298,873 while the rural population was 808,185.

From the standpoint of nationality, the distribution is as follows : Estonians 969,976 (245,191 in towns and 724,785 in the country), Russians 91,109 (26,444 and 64,665 respectively), Germans 18,319 (respectively 14,257 and 4,062), Swedish 7,850 (respectively 1,231 and 6,619), other nationalities 19,805 (respectively 11,750 and 8,055).

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(1) This article has been prepared in response to the request of the Bureau by the Minister of Agriculture of Estonia to whom it is desired to express the gratitude of the International Institute of Agriculture. As the article reached us in German certain terms for which no equivalents exist in English are shown in brackets in that language.

The following statement shows the number of persons engaged in and deriving maintenance from:

agriculture . . . . .	650,764
industry . . . . .	168,565
trade . . . . .	44,004
transport and communications . . . . .	36,908
professional classes, officials, physicians . . . . .	61,703
domestic servants and in temporary employment. . . . .	85,302
in other employments . . . . .	59,813

## II. — CAUSES OF THE AGRARIAN REFORM.

If a just idea of the necessity for agrarian reform in Estonia, of its economic and political causes and its legal and moral bases is to be formed, a closer acquaintance must be gained with the agrarian conditions that have obtained in Estonia in the course of centuries.

The causes of the agrarian reform are to be sought in the social and economic situation of the Estonian people, which up to the time of the Russian Revolution was almost intolerable and hopeless in spite of the numerous efforts made to improve conditions and to raise the standard of living at least to the level of the rural population of Eastern Europe.

As a result of the prevailing liberalism, the Estonian peasants were, it is true, freed from serfdom at the beginning of the 19th century. Their general situation however remained almost unchanged, owing to the fact that all the lands on which the peasant farmers had usufruct were declared to belong in their entirety to the noble estates, and to the fact that no powers of migration were ensured to the rural population such as had been partially gained in other European countries and even in Russia.

The landowner thus became the potential source of all agricultural work and of all means of livelihood, and it depended on his favour whether the rural population could find the means of subsistence or not. To obtain the chance of cultivating a plot of land the peasant was required as before to do service on the estate lands. Although the natural growth of the rural population brought about an increase in the number of workers, there was no diminution in these demands for forced labour but rather an increase, owing to the introduction of a more intensive type of cultivation in the second half of last century.

On the other hand there was a shrinkage in the areas under peasant cultivation due to the expansion of the estates at the expense of these. Up to the reform which was carried out in the sixties it constantly happened that lands in peasant cultivation were curtailed or were amalgamated with the estates or at best were exchanged for poorer or uncultivated land. In consequence the conditions of existence of the rural population naturally deteriorated.

The enfranchisement of the peasants, or the "first agrarian reform", as it is called by the Baltic historians, had thus only a moral significance; it created a national sentiment and the indigenous Estonian population which had for so many

centuries remained patient and quiescent began to seek means for improvement of their economic situation. This struggle for better conditions was rendered very difficult from the fact that the power remained in the hands of the large landowners. There was in existence in the Baltic States a system of independent administration devolving on the owners of large estates. For this class the measures enacted by the central government of the Russian Empire had little or no significance, and were either altogether disregarded, or were carried into effect in a much modified form corresponding to the interests of the landowning class.

In this way the situation of the peasants only became worse after the abolition of serfdom, and even among the large landowners from time to time the feeling was voiced that changes ought to be introduced. A long time however elapsed before practical measures were taken for ameliorating the *status quo*. Differences of opinion among the estate owners and the conflict between the independent local administrations and the central government had the effect of postponing for nearly twenty years the carrying out of the second agrarian reform. Thus, for example, the forced services, the infliction of corporal punishment, the prohibition of migration from place to place were prolonged in Estonia till after 1860, that is to say till after the publication of the new law relating to the peasant farmers. From this epoch the peasant farm holdings began to be on a rent paying rather than a produce sharing basis, and thence the transition took place to sale to the farmers of the lands and in addition the rural population were permitted to migrate although in limited numbers and under definite conditions.

The economic situation of the peasants did not however greatly improve; money rents were high and the purchase price of land was beyond the means of those who were engaged in farming it. According to A. Tobien ("Die Agrargesetzgebung Livlands in 19ten Jahrhundert"), the price of land was as a rule higher than in the "black earth" departments of Russia, and according to the Russian senator Manassein, who made a report on conditions in the Baltic provinces, it was three or four times as high. Under such conditions the process by which the peasants acquired ownership of land could only be very slow.

In the former province of Estonia — the northern part of the present Republic — sales of lands to peasant farmers, according to A. v. Gernet ("Geschichte und System des bauerlichen Agrarrechte in Estland"), amounted up to 1883, that is in the course of 20 years, to 16.84 per cent. only of the lands formerly under peasant cultivation. Up to 1899 the total was 12,592 units, or 47.62 per cent. only. In the former Government of Livonia (now the southern part of Estonia) according to A. Tobien, the percentage of land sales was 25.7 per cent. by 1872, and 85.3 by 1902. On the other hand, of the lands under peasant cultivation which formed part of the estates belonging to the Treasury of the Russian Empire up to 1886 in the northern Government 418 units were sold to peasants in all, while in Livonia the farms sold in this way numbered 425 in 1860. The more rapid sale of lands forming part of the Crown estates is explained by the fact that the price of this land was only a third of the price of that of the noble estates.

In 1918 the number of units not yet purchased but merely rented by peasant farmers throughout the whole State was 23,023, or an area of nearly 560,000 hectares. Sales had been effected to the peasants of 51,640 units with a total area of nearly 1,770,000 hectares. There remained in the hands of the large landowners 1,149 estates with a total area of 1,880,000 hectares.

In respect to the lands they sold the large landowners retained a whole series of economic privileges, e. g. the right of distilling and brewing, the right of constructing mills, of establishing markets, as well as hunting and fishing rights. In this way

the peasant farmer was kept as before in a certain economic dependence on the estate owner. In Southern Estonia, or the former province of Livonia, the repair of all public roads was an obligation on the peasant farmers.

Even worse off than the peasant farmers were the farm workers ; until quite recently no measures for their protection existed.

The farm labourers were mostly to be found on the peasant holdings during the period before the transition to a rent-paying basis began. So long as the peasant farmers had to give services on the noble estates in exchange for the use of their lands, each one usually employed for this purpose two or three labourers engaged by the year. Life on a peasant farm of a labourer whose duty it was to perform these forced services could not have been easier than that of the peasant farmer himself, and was probably much harder. Nor did the situation of the labourers improve in any way when in the sixties the forced services were abolished and the conditions under which the peasant farms were worked became modified. The greater number of the farm workers who did the work on the noble estates had nothing except the usufruct of the plots of land known as "Quoten-" or "Sechstelländereien", viz., pieces of land detached from the total area of the land assigned to the peasant farmers and amounting to about one-fifth or one-sixth, in accordance with the land register as prepared at the time of the peasant enfranchisement by the laws of 1859 and 1860. The double purpose was thus served of settling those persons who would work on the noble estates and of rounding off these lands. A small number were taken on as permanent labourers on the estates at a very low wage. It was unnecessary for the landowners to take trouble to improve the conditions of their labourers, since it was always easy to obtain labour. On the reserve lands, the "Quoten" and "Sechstel" lands, there was a mass of people who could be employed on the estates on the principle of forced services. In this way the burdens weighed even more heavily than before. The holders of the plots so designated were thus paying their rent in the form of forced services up to the Russian Revolution.

The position of any labourers who remained on the peasant holdings was not more satisfactory, as the farmer, whether tenant or owner, was crippled by the high rent or heavy purchase price and could in consequence do nothing to improve the economic situation of his labourers.

The harsh economic conditions that have been described resulted in a profound hatred of the large landowners on the part of the rural population and the pent up irritation took the form of revolts at Heiligensee in southern Estonia in 1841, in Mahtra in northern Estonia in 1858, while in 1905 many estates were burnt and pillaged.

This description of the economic conditions prevailing before the agrarian reform should include some mention of land settlement. This however was either not organised at all or very inadequately. Up to the middle of last century all provision of the kind formed part of the obligations of the great landowner, who acted according to his judgment and naturally in his own interest.

On the noble estates settlement could only take place if services were undertaken in exchange. The scanty attention given to the needs of the existing rural population finds confirmation in the fact that on the initiative of the Diet of Livonia settlers were brought in between 1860 and 1870 from Germany as farm workers. The travelling expenses of these persons were paid and they received higher wages than the Estonian workers so that these latter finding themselves left without the chance of work or the means to live took refuge in the towns or emigrated.

At a later period also German colonists were brought in and a purely German settlement is even still in existence in the Võru district in the commune of Sõmerpalu.

During the German occupation in 1918 the estate owners of that area proposed to hand over one-third of the noble estates to German settlers.

It was only after 1870 that the indigenous population could obtain land for settlement without the obligation of forced services, and even then it was only possible on the Russian crown lands. Even so there were limitations; the crown lands were mainly in southern Estonia and settlement was conditional on acceptance of the Greek orthodox faith.

The settlers' plots formed by order of the Russian administration were usually too small, being only from one-two hectares as a rule, so that the settlers often found it difficult to maintain their families on these parcels, and accordingly this measure did not do much for the raising of the social position of the people.

The Russian Peasants' Bank only began its settlement operations in Estonia in the present century (1907), and in the short time which has elapsed has only been able to obtain very small results. For this reason the situation of the youthful generation, that is to say of the second and third son in a family whether of owner or of the labouring class, was very serious: such persons had no chance of making their living in their own country.

The conditions outlined above, the difficult economic position and the absence of favourable openings for land settlement, resulted with the rural population in a general migration to the towns and to the provinces in the interior of Russia whenever opportunity offered. In Southern Estonia the prospecting (*Auskundschaften*) of land for settlement began in the forties, in Northern Estonia in the sixties. The number of the urban population rose in the years 1871 to 1897 from 48,300 to 156,000 and in 1922 had reached 298,000. According to the statistics of Estonians settled in other countries, the number who migrated to Russia and to foreign countries was 250,000 in each case, but it is probable that this figure should be higher, from 600,000 to 1,000,000, since many Estonian emigrants have been naturalised and are accordingly hard to trace.

Under different agrarian conditions the necessity for emigration would never have arisen; the country was comparatively sparsely populated — the 1922 census returns give a density of 13.6 to 18.9 with an average of 17.5 persons to the square kilometre — the geographical situation was favourable with the capital of Russia providing a market close at hand, and the natural conditions of soil and climate would have favoured a much denser population and a much more extensive area under cultivation than was the case at the time of the outbreak of war.

If the situation thus arisen was to be improved, the social and economic conditions modified and developed along sound lines, the problem of land settlement solved and the general level of living raised, a new agrarian reform was essential. An impulse was given by the Russian revolution of 1905 for the preparation of a series of proposals none of which however were realised owing to the opposition of the local nobility. Even the comparatively moderate proposal of the Russian constitutional democratic party (the so-called cadets' party) was not adopted by the Government.

The great Russian Revolution which broke out during the European war, the difficult period of the German occupation and the struggle which followed for Estonian independence, all contributed to a revival of the agrarian question in a form more imperatively demanding attention than ever before. The patience of the people was exhausted and their faith in a peaceful solution lost. It was evident that the land should now be taken away from the great landowners who had for centuries dominated the people on the land and who for the most part had always shown themselves hostile. The land was declared the property of the people. No delay

was possible, as on the rapidity of the reform depended the future of the people and of the whole land. The alternative would have been that the anarchist communist movement which had seized the power in Russia would have extended to Estonia, would have destroyed it as an independent State and would have stifled every germ of further development in the Estonian people.

The first care of the Temporary Government of the Estonian Republic, when it finally achieved independence at the end of 1918, was to reorganise agrarian conditions on the basis of a radical agrarian reform.

### III. — THE LEGAL BASIS OF THE AGRARIAN REFORM.

#### *Legislation.*

The first provisions relating to the agrarian reform were contained in the Decrees promulgated on 27 November 1918 by the National Council (*Maanõukogu* or temporary legislative assembly) regarding the exercise of control over the noble lands and the beginning of an agrarian organisation. These Decrees were followed by a series of Orders issued by the Temporary Government in which the estates and lands situated in the territory of the Estonian Republic but belonging to the Russian Empire and to the local nobility were declared to be the property of the State and a control was introduced over the working of private properties (large estates) in order that badly worked farms should be managed by the State.

In virtue of the provisions they contained, these measures may be regarded as preparatory to the agrarian reform; their object was to conserve the national property and to protect the country against the risk of a famine until the Constituent Assembly decided on the question of agrarian reform. We may here note that a third of the estates (about 400) had been abandoned by their owners in consequence of the conditions brought about by the War and the Revolution; the necessary labour could not be found and the fields were not ploughed and remained uncultivated. But at the same time the direction to be taken by the future agrarian organisation was traced in these measures, since in pursuance of the Order of the National Council dated 27 November the Minister of Agriculture was instructed immediately to set about the preparatory work for increasing the land attached to the labourers' dwellings (*Kantmiked*) and to supply land to those who did not possess it. By an Order of the Temporary Government dated 20 December 1918 the citizens who had distinguished themselves at the front by their courage or had become disabled, and also the families of soldiers who had been killed in fighting for the country, obtained for cultivation land belonging to the Peasants' Bank or to the Russian Crown that had been expropriated by the State.

Immediately after the formation of the Constituent Assembly, the Agrarian Law was drafted; it was completed in the autumn of 1919 and adopted on 10 October of that year.

The principal object of the Law was the liquidation of the large estates and the creation of small holdings in their stead.

In order to create a reserve of lands belonging to the State the following lands were expropriated by the Law:

1. All estates belonging to the owners of the noble lands, and lands detached therefrom, except the lands belonging to the communes, to philanthropic and scientific institutions, together with all their farm stock. The stock which is the property of the tenant and belongs to a single farm is not subject to expropriation, nor is the



stock of which the owner has need for the working of a settlement holding, if such has been allotted to him.

2. The parishes and lands belonging to the Church, except the cemeteries and the land on which churches and convents are built, including the farm attached to them (1).

Under the Agrarian Law, the large estates situated within the boundaries of the former Estonia were transformed into State property. In those parts of the country which had previously belonged to the Governments of Petersburg and Pleskau and after the Treaty of Peace had been incorporated into the Estonian Republic — their area is 2,250 square kilometres — there were no noble estates. That is why the Agrarian Law of 1919 did not apply to conditions in these regions and the large estates there were expropriated by the Special Law of 22 June 1922. In these regions estates of more than 75 dessiatines (about 82 hectares) were considered as large estates. The farm stock was not expropriated.

Later the State reserve of lands was completed by the Law of 26 March 1926 on the transformation of abandoned lands. The boundary between Estonia and Russia fixed by the Treaty of Peace divided in two a large number of lands, the majority of which belonged to the village commune; the villages and the farms themselves remained inside the Russian boundary, whilst their lands were to a greater or less extent incorporated with the territory of the Estonian Republic; these lands were added to the reserve of lands belonging to the State under the Law of 26 March 1926.

To resume, in order to create a State reserve of lands in former Estonia, that is, in the territory which was the nucleus of the present Republic, all the large estates were expropriated to which noble and economic prerogatives were attached, and in the territory added to Estonia in conformity with the Treaty of Peace between Russia and Estonia (that is, in Transarovia and in the region of Petchori) all the large estates exceeding 75 dessiatines and all lands left without an owner were added to the reserve of lands.

For lands declared to belong to the State reserve of lands an indemnity was paid — the Law on the payment of indemnities was adopted on 5 March 1926 — except in the case of:

(a) peasant lands, *Quotenland* (Southern Estonia) and *Sechsteland* (Northern Estonia);

(b) lands belonging to owners who had acted against the independence of the Estonian Republic;

(c) lands belonging to the Russian Government, to the Peasants' Banks and to the nobles;

(d) lands left without owner (in conformity with the Law of 26 March 1926).

The Agrarian Laws above-mentioned and the Laws passed to complete them, namely:

(1) The large estates consisted of: (1) Noble estates (*Rittergüter*); (2) lands belonging to the Crown; (3) lands belonging to the churches and (4) lands detached from the noble estates. There were in all 1,149 large properties with a total area of 2,428,087 hectares, or 57 per cent. of the total area.

Of the large estates, 1,965,818 hectares (80 per cent.) were owned by 618 individuals; 239,518 hectares (9.9 per cent.) belonged to the Russian Crown; 67,052 hectares (2.7 per cent.) belonged to the Agrarian Banks; 54,137 hectares (2.3 per cent.) belonged to the churches; 53,836 hectares (2.2 per cent.) belonged to noble institutions (*Ritterschaft*), and 47,726 hectares (2 per cent.) to towns.

Of the total area of 2,428,087 hectares, 537,015 hectares (22.9 per cent.) were let to small farmers and in all the number of lands farmed by tenants was 23,023.

(1) The Law of 16 June 1925 on the conditions under which lands could be granted in emphyteusis or in ownership ;

(2) The Law of 18 December 1925 on the granting of land as a gift in reward of services ;

(3) The Law of 10 February 1928 on the granting in ownership of industrial enterprises and of orchards declared to belong to the State ;

(4) The Law of 6 December 1927 on the attribution of lands to towns (large towns and small market towns) ;

(5) The Law of 10 February 1931 on the attribution of lands to autonomous administrations and to organisations of public utility ;  
lay down the following bases for the transformation of the State reserve of lands :

The forests situated on the lands expropriated are not distributed, but remain the property of the State, while the other lands capable of being utilised for agricultural purposes shall be let in emphyteusis or sold :

(a) to serve for the housing both of inhabitants of towns and of the rural population ;

(b) for the formation of small agricultural holdings ;

(c) to enlarge existing small holdings ;

(d) to agricultural, educational, or co-operative associations, or to associations of public interest, for their special purposes ;

(e) to the autonomous administrations of towns to provide the area necessary for the enlargement of their lands ;

(f) to the rural autonomous administrations (districts and communes) in order that they may provide land for their officials and employees living in the country and have the areas necessary for purposes of public interest.

The State reserve of lands may also be employed :

(g) to exchange with lands in private ownership in order to round off estates, and

(h) to let lands on lease for a term of years (up to 25).

It is in conformity with this last point that the provisional utilisation of the State reserve of lands has taken place. All the farms, both those which already existed and those which were formed by the division of the large holdings, were let for a term of years (usually for six years) in order that they might be cultivated. The sale of the land, or the letting of it in emphyteusis began in 1926, that is, after the promulgation of the special laws relating thereto which we have mentioned above (1).

(1) Besides the laws on agrarian reform already mentioned, the following laws must also be considered as forming part of the agrarian legislation : (1) the Law on the compulsory sale of lands belonging to communes and institutions and rented land in private ownership (26 February 1926) and (2) the Law of 21 December 1926 on the compulsory sale of rented lands in existing market towns and market towns in course of formation.

These two laws aim at guaranteeing to the tenants of lands not expropriated by the State under the agrarian laws a certain conditional security, making it possible for them to buy their lands with or without the consent of the owner. Of the tenants of peasant lands only those have this right of purchase who have not more than 4 hectares of rented lands, garden and arable fields and in the case that the dwelling-house belongs to the person who cultivates the land or that half the arable land has been created by him by the cultivation of land previously uncultivated. The maximum size of a holding which can be so purchased is 50 hectares and in existing market towns and market towns in course of formation 7000 square metres. Tenants already possessing land have not the right to buy the lands they rent. The payment for lands subjected to compulsory sale takes place on the basis of an agreement between the contracting parties. If such an agreement has not been reached, the payment is fixed by the consolidation commissions in accordance with the conditions laid down in the Law on the granting of State lands in emphyteusis or in ownership, but in the existing market towns and market towns in course of formation in accordance with average local prices.

*The Authorities by which the New Agrarian Organisation is Carried out.*

The duty of taking over from the former owners the estates expropriated under the Agrarian Law, of administering them, of providing for consolidation and settlement devolves on the Ministry of Agriculture, which carries out these measures in conformity with regulations issued by the Government of the Republic. The lands expropriated under the Agrarian Law were taken over and valued by a local commission, of which the chairman is the local representative of the Ministry of Agriculture and the members are the representatives of the local administrations of districts and communes.

The distribution of the land is made by the consolidation commissions — of first instance by the district commission, which consists of a judge as chairman, of two representatives of the Ministry of Agriculture and of one representative of each communal and district administration, and, of second instance, by the principal commission consisting of four high officials of the Ministry of Agriculture with a judge as chairman, to which there is an appeal from the district commission.

Against the decisions of the principal commission appeal may be made to the Supreme Court.

The competence of the consolidation commission extends also to the fixing of the amount of the settlement loans and of the indemnities to be paid to the former owners.

As to the selection of settlers, the persons who are to receive lands out of the State reserve of lands (settlement lots) are chosen by the autonomous district administration from amongst the candidates proposed by the communal council. Against its decisions an appeal may be presented to the competent court of justice.

Lands intended for the erection of dwellings (*Heimstätten*) are drawn by lot amongst the inhabitants of the localities in question who do not possess lands, a procedure which must be confirmed by the district administrations.

Ex-service men who had taken an active part in the war for the liberation of Estonia and specially distinguished themselves by their bravery in face of the enemy or who have become disabled and in addition, the families of soldiers who fell fighting for their country, settlers on lands newly cleared, former workers on noble estates, artisans and fishermen can obtain lands in pursuance of a decision of the Ministry of Agriculture without the intervention of the autonomous administration.

The financial operations rendered necessary by the agrarian reform — the receipt of rents and of purchase money, the payment of loans, etc. — are carried out by the National Bank of Estonia, founded in 1926.

As appears from what we have just said, no provision was made for the special participation in carrying out the agrarian reform of the representatives of the rural population organised according to social groups.

The protection of local interests is assured by the participation of two representatives of the autonomous administration in the work of the consolidation commis-

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When the price of the land is compulsorily fixed without a preliminary agreement, the price is paid to the owner by the State which afterwards collects it from the purchaser in annual payments over a long series of years.

The purchasers of rented land transferred in virtue of an agreement and also those who occupy lands rented from existing market towns or market towns in course of formation do not enjoy this privilege.

Under this Law about 10,000 rented holdings have been compulsorily sold.

sion, whilst the choice of the persons who are to receive land is completely left to the judgement of the autonomous local administration in which it has been provided that all social classes shall be represented on the basis of a proportional vote.

*[The Classes of Landowners subjected to Expropriation.]*

In establishing the new land system, the measures were first applied to the lands belonging to the Russian Empire, to the Peasants' Bank and to the corporation of the nobility, the *Ritterschaft*. These included 92 estates with a total area of 239,518 hectares belonging to the former Russian Empire; 19 estates with a total area of 67,052 hectares belonging to the Peasants' Bank, and 9 estates with an area of 51,109 hectares belonging to the *Ritterschaft*.

The noble estates (*Rittergüter*) belonging to private individuals, the lands forming part of the parish lands and other lands belonging to the Church were also subjected to expropriation under the Agrarian Law.

In all, 1,934,678 hectares belonging to individuals and 54,137 hectares belonging to the Church were expropriated.

In consequence of the extension of the Agrarian Law to parts of the former Russian provinces of Pskov and Petersburg, lands were there subjected to expropriation when the owner possessed more than 82 hectares. Under this provision 67 estates with a total area of 28,538 hectares were expropriated. Estates cut in two and incorporated in Estonia by the Peace Treaty concluded with the U. S. S. R. were also subjected to expropriation by the Law on abandoned lands. Of these estates, 250, with a total area of 6,173 hectares, were expropriated.

The total area of lands expropriated was thus 2,382,205 hectares.

All the lands were compulsorily expropriated and became the property of the State. Up to the definite transfer of these lands to the State the old owners remained as managers of the estates in the capacity of *negotiorum gestores*.

*Lands not Subjected to Expropriation.*

Of the large estates, 3.4 per cent. were not affected by the agrarian reform. Of such lands, 58.5 per cent. belonged to the towns, 39.6 per cent. to individuals and 1.9 per cent. to noble institutions.

The lands which remained in the hands of private individuals and were not expropriated were, in particular, those which did not belong to the owners of noble estates, whilst the lands of noble institutions which were not expropriated were those which belonged to philanthropic institutions. Of the lands belonging to the towns none were expropriated.

In Transnarovia and in the districts of Petchori lands belonging to the village communes and to co-operative land associations (*Seelenland*) which were almost without exception small agricultural holdings, were not expropriated and, moreover, on the expropriated lands, 50 dessiatines (54 hectares) were left to each owner to be cultivated by him.

The Law did not lay down any principles for the cultivation of lands to which the reform did not apply.

Of the lands originally intended to be expropriated, the following were restored to the old owners, that is, they were freed from expropriation by the Laws of 26 May 1925, 17 May 1927 and 21 December 1928:

- (1) Lands which had been bought by the last owner before he had acquired a noble estate ;
- (2) Lands detached from another noble estate not belonging to the owner of the lands in question, up to 50 hectares ;
- (3) Settlement lands granted to previous owners under an agrarian law ;
- (4) The lands belonging to churches, parcels of 50 hectares for each parish to supply the needs of persons employed in the church ;
- (5) Sites for buildings in the market towns ;
- (6) Lands sold prior to 15 October 1919 on the basis of preliminary agreements, the effective transfer of which to the name of the purchaser had not yet taken place ;
- (7) All industrial undertakings subject to the industrial tax with the lands which are necessary to them (1).

### *Restrictions and Charges affecting Expropriated Lands.*

The charges on expropriated lands in favour of State institutions and of the autonomous administrations remained in force, while charges in favour of the noble institutions, of the churches and of private individuals were abolished. Servitudes were also abolished where they prevented the utilisation, the division or the acquisition of lands by the State and restrictions on sale and division and rights of redemption and entails were also abolished.

### *The Utilisation of the State Reserve of Lands.*

As we have already said, the principal object of the Agrarian Law was the creation of small holdings in place of large estates. The State reserve of lands can be used either for settlement or the creation of small independent holdings (*Siedlungsstellen*) or for the consolidation of existing small holdings (*Anliegerstellen*). The rented lands of the noble estates have had to remain in the hands of the old tenants, but it has been possible to enlarge them if they were too small or to reduce them if, in relation to the size of the farm, the tenants occupied too much land.

In practice it was particularly settlement holdings that were formed at first, because there were many landless persons and many applicants who were specially privileged, having taken part in the War of Liberation. But latterly importance is attached particularly to the enlargement of small holdings because in certain localities there are many holdings that are too small for the maintenance of a family if the occupier has no possibility of earning something outside his holding and where, in consequence, an enlargement is absolutely necessary in order to attach the small farmer to the land.

In enlarging these small holdings the principle is followed that in each locality, in the commune or in the village, there ought to be holdings of sizes as different as possible, so as mutually to balance one another. According to the possibilities of earning, small auxiliary holdings may be created for agricultural workers (*Heimstätten*) ;

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(1) Up to 1 April 1930 the following lands were restored : (a) lands belonging to owners of noble estates, 61 estates containing 4,004.25 hectares ; (b) settlement lands granted to previous owners, 314 estates, 11,078.77 hectares ; (c) lands belonging to the churches, 58 estates, 2,838.40 hectares ; (d) sites for buildings, 6 sites, 4.55 hectares ; (e) lands sold under preliminary agreements, 1,651 estates, 32,911.10 hectares ; (f) industrial enterprises, 31 with 3,087.49 hectares. Total, 2,121 estates, containing 53,924.56 hectares.

if these possibilities are small, some of these small holdings must be enlarged up to the limit necessary for supplying the needs of a family, that is, up to the area sufficient for the maintenance of a family. A subsistence holding (*Ackernahrung*) is generally considered to be about 10 to 12 hectares of cultivable land, or a farm that can be cultivated with the aid of one horse. In all cases where it is possible, the workers' holdings are so enlarged as to permit the keeping of some head of stock (up to 2 to 3 acres). In granting lands for rounding off existing farms account is, of course, taken of the capacity of those who cultivate it, as well as of the position of the holdings themselves, for only such holdings can be enlarged as are situated near to lands belonging to the State reserve of lands.

Besides the creation of new holdings and the enlargement of existing holdings, it was necessary to draw upon the State reserve of lands to enlarge the large towns and market towns and to satisfy the requirements of the autonomous administrations, of the agricultural schools, of the experiment stations, of the co-operative societies and of the industrials undertakings, while taking account always of individual needs.

The large towns, the market towns, and the autonomous administrations of the communes and districts obtain lands from the State reserve of lands gratuitously, while individuals and corporate bodies can only obtain land by paying for it.

#### *Conditions regarding the Selection of Settlers.*

In selecting persons to whom land is to be supplied, it must not be overlooked that applicants must possess qualifications that will enable them to cultivate efficiently the lands that will be assigned to them.

In the distribution of lands preference is given in the following order :

- (a) to tenants of peasant holdings, to small farmers and to agricultural workers on the expropriated lands ;
- (b) to service-men who specially distinguished themselves during the War of Liberation ;
- (c) to service-men disabled in the War of Liberation, who have lost up to 40 per cent. of their working capacity ;
- (d) to the families of service-men who were killed in the War of Liberation ;
- (e) to persons who took part in battles during the War of Liberation.

As we have already noted, the Minister of Agriculture can assign lands to artisans and fishermen outside this order, but the artisans enjoy no other privileges.

Apart from individuals there were co-operative societies which received land, namely :

- (a) co-operative dairies ;
- (b) co-operative societies for the distillation of potato spirit ;
- (c) co-operative societies for the working of peat-bogs ;
- (d) co-operative societies for the joint use of machines ;
- (e) co-operative distributive societies.

Amongst the persons whose livelihood depended on the expropriated lands, those who had been small tenants and agricultural workers obtained the right to have land. If the latter have lost their working capacity, they receive from the State the right to a pension ; no other security is given to them.

The former owners of lands in the parts of the provinces of Pskov and Petersburg annexed to Estonia which were expropriated in pursuance of the agrarian reform could, as we have already noted, retain 50 hectares of their land, these 50

hectares not being expropriated. In those parts of the old provinces of Estonia and Livonia which now form part of the Republic of Estonia, the former owners could obtain land in accordance with the general rule (that is, a settlement holding not more than 50 hectares in extent), in virtue of a decision of the district administration or, by a decision of the Ministry of Agriculture, as a recompense for services rendered during the war.

The former owners may dispose of these lands, which are given to them as hereditary property and without any restriction.

The territory of Estonia not being large, no special rules have been fixed regarding the size of settlement holdings in the different parts of the country. The size of new peasant holding depends rather on the quality of the lands, on their position and on other local conditions favouring their working and the marketing of the products. Fifty hectares of cultivable land is regarded as the maximum size in the whole country for a settlement holding. Generally the size of such holding varies between 15 and 25 hectares.

In the different districts the average size of the peasant holdings is as follows :

District —	New holdings — hectares	Old holdings — hectares
Viru (Wierland) . . . . .	16.08	16.68
Järva (Jerwen) . . . . .	17.00	20.21
Harju (Harrien) . . . . .	20.54	23.86
Lääne (Wieck) . . . . .	20.76	26.54
Saare (Oesel) . . . . .	17.36	25.74
Pärnu (Pernau) . . . . .	17.39	29.08
Viljandi (Fellin) . . . . .	15.19	20.64
Tartu (Dorpat) . . . . .	14.13	16.23
Valga (Walk) . . . . .	13.70	25.63
Võru (Werro) . . . . .	12.16	20.23
Petseri (Petschur) . . . . .	12.75	12.75
—	—	—
For the whole country . . . . .	16.41	21.68

The expenses incurred in carrying out the new land organisation are charged to the national budget. In like manner the new settlers received financial help from the State for the equipment of their holdings until 1929, in which year a settlement fund was established.

The expenses hitherto incurred on account of the agrarian reform are as set out in Table I (page 132).

TABLE I. — *Expenses Incurred in Carrying out the Agrarian Reform in the Years 1918 to 1930.*

Years	General administration expenses	Expenses incurred to cover engagements undertaken (payments in respect of expropriated lands, mortgage debt, repayment of rents, compensation for lands expropriated, etc.)	Loans (loans for building granted to settlers, loans for the purchase of stock, loans for assistance during the years when dwelling-houses in the country are being constructed).	Advantages conferred on the settlers (Difference between the market prices of building materials and the prices at which they were sold to settlers)	Total
1918 . . . . .	46.60	—	—	—	46.60
1919 . . . . .	14,953.55	—	—	—	14,953.55
1920 . . . . .	157,127.95	—	—	—	157,127.95
1921 . . . . .	496,635.57	—	—	91,400.65	588,036.22
1922 . . . . .	571,189.81	—	787,055 —	870,810.66	2,228,555.47
1923 . . . . .	684,487.36	13,125.97	2,285,440 —	923,074.13	3,906,127.46
1924 . . . . .	738,982.21	9,217.21	2,150,000 —	1,183,680.81	4,081,779.73
1925 . . . . .	756,657.44	170,521.15	1,450,000 —	892,368.63	3,209,547.22
1926 (first three months) . . . . .	182,925.07	26,816.44	374,790 —	614,112.42	1,198,643.03
1926-27 . . . . .	829,989.75	217,771.01	2,400,000 —	1,190,134.68	4,637,805.44
1927-28 . . . . .	973,059.82	271,975.09	3,230,000 —	1,415,385.58	5,890,420.49
1928-29 . . . . .	990,096.13	468,714.91	2,150,000 —	985,599 —	4,594,410.04
1929-30 . . . . .	1,482,683.69	—	100,000 —	983,074.18	2,565,757.87
Valuation of forests of settlers by forest officials up to 1930 . . . . .	112,228 —	—	—	—	112,228 —
Total . . . . .	7,991,062.95	1,178,141.78	14,927,285 —	9,149,040.24	33,245,529.97

In addition, during the year 1929-30 were spent out of the Settlement Fund: to cover the expenses of engagements undertaken, 626,636.31 crowns; in settlement loans 2,267,562.28 crowns, and in administration expenses, 2,900,362.48 crowns.

### *The Payment of Compensation to the Former Owner and the Sale Price of Lands belonging to the State Reserve of Lands.*

The compensation for expropriated lands is paid to the former owners by the State in accordance with the productive capacity of the land. The unit of productive capacity is the "rouble of net return" (*Reinertragsrubel*), which dates from the Russian domination. The State pays 7.5 Estonian crowns for the land of which the productive capacity is expressed by one rouble of net return. The former owners receive the compensation in the form of bonds guaranteed by the whole resources of the State. The bonds are paid off by the State in the course of 55 years and bear interest at the rate of 2.66 per cent. The buildings and undertakings serving agricultural purposes regarded as belonging to the land, as well as the live and dead stock, were expropriated at the same time as the land.

For the buildings regarded as belonging to the land no special compensation was paid. For the live stock compensation was paid on the basis of the market prices during the year 1914, whilst for the dead stock and plant set up on the farm the compensation was paid on the basis of the price at which they had been purchased, less a certain percentage for deterioration. Compensation for the stock was paid in cash.

When land was sold for purposes of settlement the price was also calculated according to the productive capacity expressed in roubles of net return. The price of the land of which the productive capacity is one rouble of net return is 11 Estonian



crowns or, in the islands, 9 Estonian crowns, which is equivalent to a price of about 60 crowns for a hectare of cultivable land of average quality.

This price is paid by the purchasers over a period of 55  $\frac{1}{2}$  years for agricultural holdings and of 36 years for non-agricultural holdings (lands serving for commercial or industrial enterprises, etc.). The debt is secured by a first mortgage on the property.

#### *The Right to Place Charges on the New Holdings.*

To make it possible for persons who have received land to acquire stock and to set up the necessary plant, the State sells them stock on credit or grants loans to enable them to purchase it. The maximum limit for the purchase of stock was 500 Estonian crowns. For the construction of buildings, material from the State forests was supplied at fixed prices, for which payment could also be made by instalments. In addition to building material, loans were granted up to 60 per cent. of the value of the buildings, if they were made of wood, and up to 80 per cent. if made of fire-resisting materials.

For works of land improvement loans could be obtained up to 75 per cent. of the proposed works. All the above-mentioned debts on a holding are fused into a single mortgage debt charged on the property and amortisable in 36 years, interest of 2 per cent. being paid on the debt and of  $\frac{1}{2}$  per cent. for the management expenses.

If payments is not made punctually, the sums due are recovered in accordance with the procedure laid down for the collection of the public taxes.

In addition to the above-mentioned charges, the owner of the property has the unlimited right to charge it with other mortgages in the manner prescribed by the civil laws and also to offer the property as a pledge for other loans. Additional mortgages on lands on which there are public mortgages can only be created with the consent of the Agricultural Bank of Estonia whose duty it is to see that the loans made by the State are repaid.

#### *Consolidation of Holdings.*

The boundaries of the small holdings created on the lands which had become the property of the State were made at the same time as the creation of new holdings when the agrarian reform was put into execution. But in Estonia a great part of the land not affected by the agrarian reform was very much split up. The phrase "Lapitalud" or "farms in rags" was used to describe such holdings. This dated from the time when the peasant lands were detached from the noble estates or had been brought about through the division of land when it passed by inheritance. In many villages communal lands were still to be found and in the district of Transnârovia and in the region of Petchori the Russian "mir" system still existed. For these reasons, a special Law on the consolidation of holdings was promulgated in 1926, in order that these lands should be consolidated. The consolidation of lands that had become the property of the State was carried out on the initiative of the public authorities, whilst consolidation carried out under the Law can only be undertaken at the wish of a large number of the parties interested. Consolidation is carried out when it is requested by at least one-third of the interested parties cultivating at least one-third of the lands to be consolidated. It is carried out, in the name of the Minister of Agriculture, by the same officials who carry out the agrarian reform, that is the consolidation commissions.

The consolidation of lands belonging to the State is carried out at the expense of the State. The consolidation of lands belonging to private individuals may be

carried out at the expense of the State by technicians in the service of the State or by private surveyors under the direction and control of a State official. To cover the expenses the owners of private lands are obliged to pay to the State one crown per hectare and to supply the workers necessary to carry out the works done on the lands. In the case of consolidation carried out by private surveyors, the owners of the lands obtain grants from the State Treasury up to 2 crowns per hectare of the lands consolidated in order to pay the surveyors.

In the consolidation of lands an effort is made to make each holding, as far as possible, a single block. In distributing the land it has not been possible to take much account of the buildings, as these are not suitable for small farms. In the small farms account is taken of the buildings in so far as they are capable of being utilised, and in this case sites are left free in the villages for buildings for each land-owner.

The new peasant holding created in carrying out the agrarian reform are formed separately and are not grouped in villages (*Streusiedlung*). In the former province of Livonia the same system is found in all the old peasant holdings, whereas in Northern Estonia the dwelling-houses of the old peasant holdings are usually grouped in villages. In the parts of the old provinces of Pskov and Petersburg, where the "mir" system existed, all the dwelling-houses are grouped in villages.

When as a result of the consolidation of lands belonging to the State or to private individuals a landowner goes to establish himself on entirely new land, building materials are supplied to him and loans are granted to him for the construction of new buildings, on the same system and the same conditions as in the case of settlers.

In order to keep intact the properties created in the carrying out of the agrarian reform and by consolidation their boundaries are indicated by landmarks and corresponding maps are drawn. The owners are obliged to maintain the landmarks in a good state of preservation.

#### *The Right of Ownership in the New Holdings.*

Lands detached from the State reserve of lands are either sold outright as hereditary property or let on a hereditary lease against the payment of an annual rent.

Both the owner and the leaseholder can sell their rights in the land, or give them away, or bequeath them, either wholly or partially. For the sale of lands mortgaged as security for the repayment of a loan granted by the State or of debts contracted at the time of purchase, the consent of the National Bank of Estonia is necessary.

No one can obtain in ownership or in emphyteusis more than 50 hectares of cultivable lands from the State reserve of lands, whether by purchase, by gift or by inheritance. If more than 50 hectares of land come into the hands of one person, whether in emphyteusis or by a transfer of the ownership, he must dispose of the ownership or the leasehold of that part of the land which exceeds the limit. If this is not done voluntarily, the court enforces the sale.

Beyond these restrictions regarding the maximum size of holding formed out of State lands there are no restrictions in regard to new peasant holdings.

#### *Restrictions on the Rights of Ownership in Old Peasant Holdings and Right of Inheritance.*

The restrictions laid down in the Laws of 1859 and 1860 on peasant lands, whereby in the northern part of Estonia (in part of the old province of Livonia) a holding newly formed could not be less than 10 thalers (about 15 hectares) in area, are still

in force. In Northern Estonia a new holding may be subdivided if it contains 3.3 hectares of arable land with a corresponding amount of meadow and pasture land. It is intended to amend this provision in accordance with the requirements of the present time and to extend to all agricultural holdings, including holdings formed on State lands, the restrictions on subdivision, in order to prevent that the land of the country, should be too much split up.

The right of inheritance of land is regulated by the general civil code, except in so far as it is subject to the restrictions laid down regarding the maximum area of peasant holdings and in regard to the distribution amongst the heirs of lands previously acquired.

In practice, both forms of inheritance usual in Western Europe are found in Estonia, that is, division amongst the heirs and succession without division (*Anerbung*), this latter being found particularly in Southern Estonia in the richer regions, whilst division amongst the heirs is usual in the more easterly regions.

(To be continued).

## CO-OPERATION

### Stages in the Development of Agricultural Co-operation in Argentina.

#### I. — THE THREE PERIODS OF ARGENTINE CO-OPERATIVE LEGISLATION.

In the history of the co-operative movement in Argentina three periods of co-operative legislation may be distinguished.

The first period is from 1884, the year in which the first co-operative society was formed, to 1906. In this period co-operation existed precariously under the regime of the ordinary commercial law ; it was recognised by the Commercial Code, but received no encouragement of any sort from the National Government nor the Provincial Governments, being regarded as a voluntary initiative of private individuals.

The second period begins in 1906, in which year some provinces began to issue administrative and fiscal legislation in favour of the development of co-operation, and ends in 1926, when the National legislature passed a special law in favour of co-operative societies in general and of agricultural co-operative societies in particular. Henceforth co-operative legislation develops in Argentina as a separate branch of law distinct from the Commercial Code.

The third and present period is characterized by the development of National and provincial legislation in favour of various kinds of co-operative society, the laws passed being essentially public laws, and from the economic point of view, showing marked preference for the co-operative organization of the producers for the collective sale of their products.

We will briefly illustrate these three periods.

*First Period.* — From 1884 to 1906 the development of the co-operative movement was so slow as to make it seem doubtful if it were capable of any great development.

The central and provincial governments thought they were sufficiently encouraging and safeguarding the development of urban and rural co-operation by recognising co-operative societies in the Commercial Code. In this they were following the example of the majority of the European countries, which did not feel the need of special legislation.

The first Commercial Code was that of 1859, promulgated by the Province of Buenos Aires ; in 1862 it was declared by Congress to be a national code. It was replaced in 1889 by the new Commercial Code, which is still in force.

According to Article 392 of this Code, co-operative societies had to adopt, for their legal constitution, one or other of the forms of company admitted by the Code. To the name of the society, however, had to be added the words "co-operative society, limited" or "unlimited" according to the form of society adopted.

By Article 394 it was laid down that "the shares shall always be held by name and each member shall have only one vote, however many shares he may possess".

It may be noted that amongst the forms of commercial company contemplated by the Code of 1889 which the co-operative societies might have adopted there was (besides the company with unlimited liability, the company containing members with unlimited liability and members with limited liability and the limited liability company) the capital and industry company composed of members who contributed goods and capital and of working members who contributed their technical and industrial capacity ; this form would have been preferable for certain kinds of co-operative society.

However the fact is that, under the regime of the ordinary commercial law, the Argentine agricultural co-operative societies could not of themselves, unaided by the State, overcome the great and numerous difficulties of the movement initiated by them in 1884.

In 1914, when the International Institute of Agriculture published the second volume of "Monographs on Co-operation in Various Countries", containing a study of the agricultural co-operative movement in Argentina, it seemed that the movement was still in its initial stage and that it was uncertain whether it would develop, owing to the unfavourable rural conditions and to the slowness with which the idea of co-operation was taking root in the country.

Argentine writers themselves noted that rural conditions, except in the so-called grain-growing region, which comprises the provinces of Buenos Aires, Santa Fé, Córdoba and Entre Ríos, were by no means propitious and, in part, definitely unfavourable to the development of co-operation, as the agricultural population, being scattered, of heterogeneous origin, unstable, dominated by the individualistic spirit of the large landowners and of the immigrant settlers, and spread over a vast territory, with inadequate means of communication and of transport, had need of considerable capital for the exploitation and colonisation of the large estates. On the other hand this population was also needful of quick returns in order to furnish the capital required rather than desirous of making a methodical and constant effort to organise themselves with a view to increasing production and reducing costs, and therefore could not feel sufficiently and generally the need of institutions based on mutual confidence and of stable relations of rural economy and of agricultural law.

This situation must be borne in mind in considering the first statistics of agricultural co-operative societies, collected by the Ministry of Agriculture in 1912-13.

There existed at that time 34 agricultural co-operative societies, comprising 22 which combined various objects (consumption, purchase, credit, colonization, irrigation, stockbreeding, etc.) ; 8 societies for mutual insurance against hail ; 1 society for insurance against fire, and 3 societies for collective irrigation.

The 22 mixed societies had a membership of only 5,494, and an effective capital (paid-up capital and reserves) of only 844,230 *pesos*.

The inadequacy of this organisation was apparent and was fully recognized by everyone.

In the Provinces of Buenos Aires and of Entre Rios a co-operative movement had already arisen primarily directed towards obtaining from the central and provincial legislatures a decisive intervention which would supplement the specific action of the Section of Agricultural Mutual Insurance and Co-operation founded by the Ministry of Agriculture.

A meeting of co-operators, held in June 1913, at Lucas Gonzales, on the initiative of the Regional Agricultural Society of Entre Rios, had in fact requested the Argentine Congress to pass a special law in favour of co-operative organisations. Three bills had already been introduced, but had failed to pass: one brought in by Senator Uriburu in 1905; one by Señor Lobos, then Minister of Agriculture, in 1911, and one by Señor Mujica, when Minister of Agriculture, in 1912.

The co-operators, at that time, complained also of the want of a system of direct agricultural credit, either for the provision of working capital or for improvements, which should be accessible to the small occupying owners and to the share-tenants, who were then compelled both in regard to sales and to loans to submit to the usurious speculation of middlemen. This situation rendered difficult the development of small occupying ownership, an institution which was still wanting but was recognized as necessary to the consolidation of the rural economy of the country and to the progress of co-operation amongst the producers.

*Second Period.* — What could not then be obtained from the central legislature, for want of a favourable public opinion was obtained here and there, hesitatingly, almost by way of propaganda, by the co-operators from various provincial legislatures.

In 1906 a law of the Province of Buenos Aires granted exemption from the tax on capital to co-operative societies having a capital of 1,000 to 7,000 *pesos*. The declared object of this law was to facilitate, as was done in some European countries and in the United States, the formation of co-operative societies, particularly societies for consumption, production and credit.

In 1915 the same Province granted special fiscal privileges to co-operative dairies. In 1913 the Province of Cordoba voted a law in favour of the Co-operative Society of Rio Cuarto, formed with the aid of the State. By a decree of the Province of Entre Rios, issued in 1919, privileges were granted to a poultry keeping society.

The Province of Mendoza, wishing to promote the formation of vine-growers' co-operative societies, issued a law in 1919 compelling sellers of grapes and wine to belong to a vine-growing and wine-making co-operative society to obtain exemption from the licence tax on wine produced in the province.

These provincial legislative provisions, combined with the political movement in favour of co-operation initiated by Uriburu in 1905 and Lahitte in 1917 and the movement brought about by some 12 bills introduced between 1905 and 1919 into the National Parliament and some provincial legislatures in favour of genuine co-operative societies and with a view to defending their special character, served to form a public opinion favourable to co-operation and to prepare the advent of the third and present period, characterised by the direct and decisive intervention of the State.

But this result was also largely brought about by the steadily growing necessity of organising the producers, and the gradual progress of the conception of co-operative and agricultural law, national and provincial, arising out of the constant strug-

gle for the shaping of agricultural law and the defence of the interests of the agricultural classes between the *Sociedad Rural* and *Federación Agraria Argentina*.

The *Sociedad Rural* is the organisation of the large landowners. It has about 8,000 members, owners and stockbreeders, who represent about 80 per cent. of the cultivated land. In opposition to this powerful society the *Federación Agraria Argentina* was formed in 1912; it is composed of the real landworkers, and in 18 years of existence it has acquired a membership of more than 30,000, distributed amongst mutual associations, largely syndical and co-operative in character.

One-eighth of the cultivators, heads of families, for the most part tenant-farmers spread over 12 provinces, are members of the federation, which represents one-third of the area sown to wheat in the country.

It controls 58 "federated co-operative societies" and carries on mutual insurance against hail, fire and accidents during employment. Its total business is more than 12 million pesos a year. Its policy is directed towards favouring credit for colonization and ordinary agricultural credit and organising depôts and warehouses for the storing and transport of the crops under the control of its federations. It aims at entering into relations with European federations with a view to an import and export trade without intermediaries.

The various struggles initiated by this powerful federation, that is, the struggle for its land programmes, for agricultural law, for credit for the formation of small occupying ownership accompanied by co-operation, for the appointment on co-operative lines of agricultural experts, for linking co-operatively the country and the town, for the exemption from land tax of lands on which collective agreements have been stipulated by the owners without intermediaries; and the struggles for the solution of other problems by collective methods, have always proved fruitful for the progress of legislation relating to rural and agricultural co-operation and to credit. They have served to bring to a head, during the past 20 years, the primary and most important question of a co-operative régime distinct from that of the commercial companies.

The information and observations set out above may serve as a commentary on the statistics of agricultural co-operation during the second period, that is, between 1906 and 1926, since, without them, it would not be possible completely to understand the very remarkable increase in the number and strength of the co-operative societies, since the obstacles which during the first period made the future of co-operation in Argentina seem so doubtful had not been removed.

For these intermediate statistics we refer the reader to the official tables contained in the report by Dr. Domingo Boréa in 1923 (1).

From these tables it will here suffice to note that the agricultural co-operative societies, which in 1912-13 numbered only 34, of which 22 were of the mixed type, in 1920-21 numbered 173, including 124 mixed societies, 12 rural banks with unlimited liability of the Raiffeisen type, 13 mutual insurance associations, the remainder being specialized societies each having a single object.

It was a modest result, as the author of the report pointed out, but significant on account of the appearance of certain of the specialized societies, the formation of which, in the first period, was rendered difficult by the adverse conditions.

These societies were: three grain mills; one society for the cultivation of fruit-trees; one for poultry-breeding; two for tobacco-growing; one for cotton-growing; and two dairy societies.

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(1) *International Review of Agricultural Economics*, Rome, International Institute of Agriculture.

On the other hand it must be noted that association in connection with arable farming and stockbreeding and kindred industries, which could not then develop on co-operative lines, developed with notable success under the ordinary commercial law, many limited liability companies being formed for agriculture, stockbreeding, and cold storage, as well as companies for dairying and the manufacture of milk products, sugar factories, companies for vine-growing and wine-making, forestry companies, etc.

The 85 mixed co-operative societies had in 1920-21 a membership of 17,935, with an effective capital of 5,760,160 *pesos*. All the societies, numbering 128, taken together had a membership of 32,209 and an effective capital of 9,232,380 *pesos* with profits amounting to 798,522 *pesos*, a figure which is in itself a notable one, but becomes even more appreciable if we take account of the indirect benefits to the members resulting from the operations of the societies and from their functions of regulating prices, of making trading more honest, and of reducing the number of dealers — benefits which were shared by the producers and consumers who had not become members.

The most noteworthy progress made in the second period of the co-operative movement in Argentina was in the creation of various federations of co-operative societies promoted by the Rural Economy and Statistics Branch of the Department of Agriculture, in collaboration with the *Museo Social Argentino*, which had already organised two co-operative congresses for the purpose.

The Rural Economy and Statistics Branch had, and still has, as its outstanding function, to promote and encourage every kind of agricultural co-operative society and agricultural mutual insurance society; to give instructions and advice; to supply model rules; to give lectures and hold meetings for the formation of new societies; to follow the co-operative movement and the mutual insurance movement throughout the world; and, lastly, to co-ordinate the action of the central and provincial governments in order to give a precise direction to the movement to the benefit of the national economy.

Hence the desirability, or economic and legal necessity of organising co-operation on federal lines, while leaving the separate federated societies independent and self-governing. The only exception to this rule is that of the Argentine Agricultural Federation of Rosario (Santa Fé), the societies affiliated to which must follow the instructions of the central body, even in matters of administration and management.

To understand the statistics and the real significance of the movement in the second period account must accordingly be taken of the working of the four regional federations — those of Rosario, Buenos Aires, Entre Rios, and Bahia Blanca — besides that of the Federation of Rural Banks.

As early as 1923 Dr. Borea envisaged the formation of a general confederation of these regional federations, which, according to resolutions passed by the co-operative congresses, should one day enter into relations with the corresponding European confederations, to organise the international exchange of agricultural produce without the need of intermediaries.

*Third Period.* — The third period of the Argentine co-operative movement begins with the Law of 20 December 1926, No. 11,388, which governs the present development of the various kinds of co-operative undertakings, old and new.

Adequately to illustrate this law and to estimate its influence we must give a short account of its origin, and comment briefly upon it. The law is the result of 20 years of efforts, resolutions, studies of comparative legislation, and careful drafting.

## II. — THE FIRST ARGENTINE CO-OPERATIVE CONGRESS.

To illustrate the present legislative basis of co-operation in Argentina and to throw light on its special characteristics, as they affect the rural economy of the country, and on the relation between agricultural and co-operative legislation, we must note the resolutions of the First Argentine Co-operative Congress, held in Buenos Aires in 1919 under the auspices of the *Museo Social Argentino* the fruitful intervention of which was prepared and assisted by the Section of Mutual Insurance and Co-operation of the Rural Economy and Statistics Branch of the Department of Agriculture.

This Congress concentrated its attention on legislative reform, and presented to the Government the draft of a general law on agricultural co-operative societies; thus the existing law finds its best and most authoritative commentary in the reports of the congress.

In order to illustrate more particularly the legal and economic conception of co-operation embodied in the law, we here give a summary of some of the resolutions which were carried into effect and foreshadowed the coming development of agricultural co-operation in Argentina.

Considering that it was indispensable and urgently necessary that there should be a special body of law relating to co-operative undertakings, in place of the Commercial Code, which was absolutely inadequate in this respect; affirming the necessity of embodying in a general law the special characteristics of co-operative societies, and defining the object of legislative intervention to be that of facilitating the legal constitution and normal working of the various kinds of society necessary for the development of the national economy, laying down special rules for the different kinds and above all for agricultural co-operative societies, the congress proposed:

1. General principles concerning the contents of the rules of co-operative societies, of whatever kind they might be.
2. General principles for societies with limited liability.
3. General principles for societies with unlimited liability.
4. A special law on the characteristics and distinctive objects and privileges of agricultural co-operative societies with several objects (the so-called "mixed" societies) or with a single object.
5. Principles on which credit should be given to co-operative agricultural societies by the National Bank or by the Mortgage Bank.
6. Special principles regarding the characteristics and the protection of co-operative societies for consumption, credit and insurance.
7. A general programme of propaganda in favour of co-operation, to be entrusted to a permanent committee of nine members, with the president of the *Museo Social Argentino* as chairman.
8. The draft of a law on vocational unions.

Regarding the economic and legal principle out of which the co-operative movement arises, the congress expressed the wish that if possible, in co-operative societies which were exclusively for consumption no interest should be paid on the capital, that the central and provincial legislatures should follow the principle of allowing the most ample liberty to all the effective energies of the nation to promote, organise and maintain all forms of co-operation, from distributive societies to building societies, in order to realise their moral and economic aims, including the national and international exchange of products, and the teaching of the prin-



ciples of mutual insurance, of co-operation, of thrift in the schools and throughout the country by means of co-operative libraries.

With regard to agricultural co-operation, the congress, asserting that co-operative societies for consumption, credit and insurance and their various economic and legal forms are indispensable for the progress and well-being of the farmers and should be combined in central co-operative societies in order to procure greater services and wider benefits, urged :

1. That agricultural co-operative societies should abandon the old forms by which they were confused with limited liability companies.

2. That the central and provincial governments should directly promote, by loans in money or in kind, the organisation of the largest possible number of co-operative institutions for production and insurance, for grain warehouses, for dairying and other industries for the manipulation of agricultural produce, and should establish inspectorates to organise, to group and to protect the various kinds of co-operative societies and their federations.

It may be recalled that the special resolution urging the intervention of the legislatures and the governments with a view to propaganda and protection, dates back to a Presidential Message of 1911 to the Argentine Congress. In this message it was said that "in new countries like Argentina, where the population is scattered and is principally composed of elements supplied by immigration, the legislative and administrative problem of agricultural co-operation and agricultural credit takes a different form from that which it takes in European countries, since in the new countries there are too few localities in which the farmers can of their own initiative form co-operative societies, supply them with capital and give them stability. Hence the necessity of promoting their formation, beginning by establishing a central organisation which, through its branches, can help to form the various kinds of co-operative societies required."

On this programme was based the proposal put forward in 1911 by Señor Lobos, then Minister of Agriculture, to form a national Agricultural Bank, with a contribution of the State towards the initial capital for the purpose of organising colonists and producers.

In other subsequent proposals it had been recognised that in Argentina the intervention of the legislature and of the government in favour of co-operation was necessary, but as we have already noted, they did not get beyond the stage of mere proposals for reform.

From 1911 to 1919, the wish was repeatedly expressed and illustrated by the advocates of rural co-operation that this reform should be carried out. In particular the doctrine of the Argentine students of co-operative law was based on the following thesis :

The problem of legislation on the subject of co-operation must be formulated and solved solely from the point of view of the actual conditions and of the existing régime (economic, political, social and financial) of each country, and particularly in relation to its special agricultural conditions. Hence the necessity of distinguishing the fundamental and general principles from the principles derived from conditions in the place of application, and of seeing how national experience has formed the principles of policy in relation to co-operation and co-operative law, adapting them to the special conditions of the country and to practical requirements.

It certainly cannot be denied that the objects of agricultural co-operation and the forms it can take are different in countries predominantly industrial from what they are in countries predominantly agricultural.

The principles of mutual insurance and collective liability are readily accepted

morally and economically, in densely populated countries, but not in heterogeneous populations. It is for this reason that mixed co-operation having various aims has seemed in Argentina to be the form of co-operation best adapted to the complex purpose of the moral and economic improvement of the rural population.

Institutions based on the unlimited joint and several liability of the members are excellent in theory but cannot be formed in face of differences of race, low density of rural population, and technical and economic methods of farming which are extensive and hazardous. In such conditions what is necessary in the first instance is above all co-operative societies with limited liability formed by stockbreeders with accessory agricultural objects to free the producers of meat from the dealers in the fairs and urban markets and also other co-operative organisations for production and sale.

In conclusion, the general principles laid down by students of co-operative law and by co-operative congresses are as follows :

1. The principal object of co-operative societies is to abolish speculative profit, but not capital, the profits being distributed to those who have contributed towards making them and a mere remuneration being assured to the capital.

2. In true co-operative societies each member must have one vote, whatever may be the capital contribution on which he will receive interest.

Such is the historic background which must be kept in view in estimating the importance of the great legislative reform of 1926, the fruit of long studies of comparative legislation and of careful drafting.

The most recent development of co-operation in Argentina, rendered possible by the efficacy of the reform of 1926, may be seen from the following information and statistics, published by the *Boletín mensual* of the Rural Economy and Statistics Branch of the Ministry of Agriculture, and reproduced with comments by the *Boletín del Museo Social Argentino* of January-March 1931. In the commercial year 1928-29 the rural co-operative societies already numbered 180. Of these 143 were actually working. They contained 25,098 members, of which 16,588 were members of mixed co-operative societies and 6,577 of rural insurance societies while the remainder belonged to agricultural co-operative societies of other types.

The capital of these societies was 6,666,604 *pesos*, of which 4,432,202 belonged to mixed societies. The total business done amounted to 67,648,161 *pesos* including business to the amount of 64,503,109 *pesos* done by the mixed societies.

Amongst the specialised societies mention may be made of three societies for the sale of fruit and vegetables and 33 co-operative *tamberos* for sheltering livestock.

The Bulletin above cited remarks that the actual volume of co-operative business is larger than is indicated by the figures quoted, as there are societies which failed to furnish returns in time for inclusion in the statistics.

Many of the Argentine co-operative societies are affiliated to one of two large organisations. One is the *Federación Agraria Argentina*, which embraces 20 societies with about 2,000 members ; the other, the *Asociación de las Cooperativas Argentinas*, to which are affiliated 57 societies, with about 9,000 members and a total capital of 2,133,924 *pesos*.

### III. — THE PRESENT LEGAL BASIS.

The fundamental law of 20 December 1926, No. 11,388, occupies in comparative co-operative legislation an exceptionally important position on account of its characteristic structure.

The Argentine legislators believe that they have solved the old question of the characteristic principle of co-operation, the existence of which is doubted by many European economists and jurists. Instead of fixing upon a single principle, such as mutuality, or sharing of profits, or variability of the capital, or prohibition to issue bonds, or any other special distinctive characteristics, held to be paramount in other legislation, they have above all established the legislative independence of co-operation, declaring that "co-operative societies are regulated by the provisions of the present law and only those societies may be called co-operative which, besides bearing the name, possess all the 22 characteristics, or positive and negative requisites specifically enumerated in Article 2." So that besides bearing the name of co-operative society, a co-operative society must combine in itself all these 22 characteristics, legal and economic at the same time, which distinguish the Argentine co-operative society from companies regulated by the Commercial Code.

This legislative and scientific innovation being little known up to the present, it is worth while to reproduce the list of characteristics :

1. The name of the co-operative society shall be accompanied by the word "Limited".
2. No limit shall be fixed by the rules to the number of members, nor to the number of shares, nor to the amount of the capital, nor to the duration of the society.
3. The shares shall be held by name and shall be indivisible and transferable only with the consent of the committee of management of the societies in accordance with conditions laid down by the rules, and all the shares, once they have been fully paid up, shall be of the same value.
4. Every member shall have only one vote, whatever may be the number of his shares.
5. The rules shall lay down the conditions of admission, suspension, withdrawal and expulsion of members. The members shall have the right to withdraw from the society at such times as may be fixed by the rules, and in the absence of any provision on this point, at the end of any business year, on giving ten days' notice.
6. When the rules prescribe an entrance fee this shall not be increased by way of compensation for the reserve fund accumulated.
7. Members leaving the society, for whatever reason, shall have no individual claim on the reserve fund.
8. In the event of the liquidation of the society, the reserve fund shall be handed to the National or Provincial Treasury, according to the place in which the head office is situated, to be utilized for the economic education of the people.
9. No advantages or privileges of any kind shall be conferred on the promoters, founders or managers, nor shall preference be given to any capital.
10. No remuneration, by way of fee or commission, nor in any other form, shall be given to those who introduce new members or find purchasers for shares.
11. Societies shall not include amongst their objects, either principal or accessory, propaganda in favour of political or religious ideas, nor of nationalities nor of particular regions ; nor shall they impose, as a condition of being admitted, any pledge on members binding them to religious organisations, political parties, or national or regional groups.
12. Credit shall not be allowed on articles purchased for consumption.
13. Credit shall not be allowed on articles purchased for consumption.
14. The committee of management, without expelling the members, may at any time order those members who hold the largest number of shares to withdraw capital. If all members have an equal number of shares the withdrawal of capital shall be made proportionately.

15. When the societies make cash loans to members, they shall not take, by way of premium or under any other denomination, any sum which would reduce the actual amount lent below the nominal amount of the loan, except a discount in lieu of the payment of interest, if it is so agreed. And the interest on loans shall not exceed 1 per cent. above the rate actually charged by official banks in similar operations ; nor shall it be increased during the period of the loan. Loans may be paid off by the borrower at any moment, without any interest charge.

16. Out of the profits realised and available interest at a rate not more than one per cent. above the interest allowed by the National Bank in giving discounts may be paid on the capital employed in operations other than credit.

17. Of the profits realised and available at the end of each commercial year, at least 5 per cent. shall be allocated to the reserve fund, and 90 per cent. shall be distributed amongst the members as follows : (a) in co-operative distributive societies, or distributive sections of co-operative societies, in proportion to the actual purchases of each member ; (b) in co-operative productive societies in proportion to the labour done by each ; (c) in co-operative societies, or sections of co-operative societies, for the purchase of requisites, for labour or for the transformation and sale of products, in proportion to the amount of the business done by each member with the society ; (d) in co-operative credit societies, or credit sections of co-operative societies, in proportion to the capital.

18. The balance-sheets and reports of the Committee of Management shall be prepared annually and submitted annually to the general meeting, which shall be held within the three months following the close of the business year.

19. General meetings shall be convened with at least eight days' notice, given in such form as each society shall lay down in its rules, and shall be held, whatever number of members may be present, an hour after the time fixed in the notice convening them unless previously half the number of members plus one have assembled.

20. The rules may prohibit voting by proxy or may authorise it. If they authorise it, proxies can only be held by a member and no member shall hold more than two proxies.

21. When the number of members exceeds 10,000 the general meeting shall take the form of a meeting of delegates elected at electoral meetings of sections or of districts in accordance with methods laid down by the rules. The same procedure may be adopted for the representation of members who reside in localities far from the place where the general meeting is held.

22. For the auditing of the society's accounts the general meetings shall elect an auditor and a substitute auditor. It may also elect for the supervision of the working of the society a council of inspection containing twice as many members as the Committee of Management and auxiliary to it.

Having laid down these requisites and characteristics, the law regulates amalgamations, federations, extension of objects, the methods of formation, recognition and authorization, the capacity of women and minors, the application of the new principles to previously existing societies and penalties for the use of the word "co-operative" by societies irregularly constituted.

Amongst the other provisions, the most important, because it implies the entry of co-operative law into the domain of public law, is Article 10, which lays down that "the Minister of Agriculture shall exercise public supervision over the co-operative societies, shall revise and certify the balance sheets submitted by them, and shall establish a service of information for the benefit of the co-operative movement of the Republic".

Article 12 is also important. It lays down that the law shall be considered as being incorporated, as a special chapter, in the Commercial Code, and that Articles 392 to 394 of the Code and any other article inconsistent with the law shall be repealed, while the provisions relating to limited liability companies, in so far as they are not inconsistent with the law, shall remain applicable, as subsidiary to the law.

The Argentine co-operative law, while inserted in the Commercial Code, has thus become a branch of public commercial law on account of its special characteristics, of its independent principles and of the decisive intervention of the Government, more than merely to aid and to safeguard them, to which co-operative institutions are subjected.

A proof of this may be found in the fact that the Rural Economy and Statistics Branch of the Ministry of Agriculture distributes model rules for co-operative societies, in which is inserted the general provision that "the Chairman of the Committee of Management is authorised (in applying for the inscription of the society in the Inspection and Encouragement Register of Co-operative Societies kept by the Ministry of Agriculture) to accept the modifications of form in the rules which the authorities may deem necessary".

The Ministry of Agriculture also distributes model rules for federations of co-operative societies in which the same authorisation is given in connection with obtaining incorporation at the hands of the provincial government of the territory in which the federation is formed.

Lastly it must again be noted that the legal position of the co-operative societies is further affected by supplementary provisions in their favour, especially in regard to taxation, freely voted by the provincial legislatures. Amongst these may be mentioned the Law of 4 July 1922 on exemption from taxation in favour of the co-operative societies of the province of Buenos Aires, supplemented by the Decree of 2 August 1922 containing regulations for the application of the law, by the Decree of 28 July 1927 on the inspection of co-operative societies, and by the Decree of 20 January 1929 which contains provincial regulations for the application of the National Law of 20 December 1926; the Decree of 27 September 1927 of the province of Santa Fé; the Law on stamp duty and the Decrees of 16 August 1927 and 14 November of the same year of the province of Cordoba in favour of co-operative development, the Law on exemption from taxation of 3 November 1919 of the province of Entre Rios; and other similar provisions issued by other provinces, mostly in the year 1928. Even some municipalities confer fiscal privileges on co-operative societies.

This legislation is completed by provisions regarding agricultural credit.

The Decree of 2 January 1929 regulates the loans that may be granted by the National Bank and the Mortgage Bank to co-operative societies in accordance with the spirit and purpose of the Law of 20 October 1926, which authorized in advance such loans in connection with the objects of the general law on co-operation then about to be passed.

To sum up, Argentina possesses a body of laws in favour of co-operation, with an implicit, but obvious, tendency to favour the development of rural co-operative societies, notably societies for production and for sale, based on this principle of policy in regard to co-operative law: the general law on the legal status of co-operative societies must precede and determine the regional laws conferring special facilitations and favours with a view to watching over, safeguarding and consolidating the federal co-operative organisation of productive forces.

## IV. — SPECIAL CO-OPERATIVE INSTITUTIONS.

Amongst the Argentine institutions which must be specially mentioned here on account of their importance are : (1) The Argentine Grain Pool, founded by the Association of Argentine Co-operative Societies ; (2) the co-operative dairies.

1. — *The Argentine Grain Pool.*

The Argentine Pool proposes to develop to the utmost extent the construction of elevators in all the grain-growing region, taking as model the organisation of the Canadian elevators. The Government intends to favour this organisation, if necessary, by special agreements with the Canadian organisation, which has submitted a proposal for the construction of 660 elevators.

The programme of the Association of Argentine Co-operative Societies regarding the working of the Pool includes :

(a) the establishment of an office for direct export to the consumers' co-operative societies of the European markets, with the object of eliminating middlemen ;

(b) the establishment of a Bank in connection with the Pool for the purpose of financing the grain-growers' co-operative societies affiliated to it, as well as the colonisation of undeveloped arable lands to be rented to members.

(c) the establishment of agricultural vocational and experimental schools in the interest of the members.

The Association of Argentine Co-operative Societies, the Argentine Rural Society and other organisations of producers and merchants, including the Grain Exchange, are unanimous in submitting to the Ministry of Agriculture resolutions and proposals concerning the better solution of the problem of marketing, resistance to the fall in prices, the development of collective agreements and other methods of commercialising and consolidating agriculture, in defence of the general interest.

2. — *The Confederation of Co-operative Dairies.*

In 1929 the Minister of Agriculture approved the rules of the General Confederation of Milk-producers' Co-operative Societies, submitted by the presidents and delegates of these societies.

The Confederation has adopted for its constitution the form of a co-operative productive society, under the provisions of the general law of 1926 on the legal status of co-operative societies of which we have already written at some length.

The principal object of the Confederation is to promote the formation of regional federations of milk-producers' societies and to combine with practical work on behalf of these societies a great moral effort " ceaselessly to inculcate the spirit of union and the respect for ideas and for persons amongst milk-producers ".

The general management is entrusted to a committee composed of six members elected by the General Meeting of delegates, together with an auditor and a substitute auditor.

The annual profits are devoted first to the payment on the shares which form the capital of interest at a rate not more than one per cent above that allowed by the National Bank in discounting. Any surplus is allocated as follows : 5 per cent.

to the legal reserve fund ; 3 per cent. as the General Meeting may decide on the proposal of the Committee, and the remainder to be returned as a bonus to the affiliated co-operative societies.

The objects of this General Confederation are :

1. Manipulation of the produce of the affiliated co-operative societies by transforming it into manufactured products, the necessary establishments being set up for the hygienic treatment of milk and its derivatives, and by storing any raw material supplied by the undertakings concerned.

2. Direct sale of the products and their derivatives to the consumer, both in the country and abroad, the necessary establishments and organisations for the purpose being set up.

3. Marketing of products by means of the formation of a market for wholesale and retail sale and the organisation of joint sales, both in the country and abroad.

4. Co-operative credit, to be organised by obtaining facilities from the State and sufficient credit for the required industrial and commercial development of the milk-producers' co-operative societies, of the regional federations and of the confederation itself, in order fully to carry out the plan laid down in the rules of the Confederation.

5. The perfecting of the co-operative societies, by the supervision of the milk-producers' co-operative societies and of their regional federations, with a view to assuring their improvement and gradual perfecting.

6. The perfecting of animal husbandry as applied to dairy stock and of the agricultural practices connected therewith.

7. Giving security to the producer by buying or renting blocks of land capable of being divided up and sub-let or sold to members of the affiliated co-operative societies.

8. Transport of products, action being taken with a view to improving and perfecting railway transport of milk and of its derivatives.

9. Collective purchases on behalf of the members, that is, the affiliated co-operative societies and the regional federations, of machines, implements, feeding-stuffs, live stock, with the advantages resulting from co-operation for purchase.

10. The perfecting of production from a hygienic point of view, every possible action being taken to secure compulsory hygienic treatment of milk for consumption, cream, butter, etc.

11. Development of insurance by organising and carrying out, amongst those who dedicate themselves to the milk industry, life insurance, insurance against accidents during work, fire insurance, hail insurance, etc.

12. Establishment of official information and publicity service required for the precise knowledge of the markets, the organisation of experiments and the diffusion of instructions, for the use of the affiliated co-operative societies and of their members.

13. Development of bonds between the producers with a view to fostering moral, economic and industrial solidarity amongst them, as well as to obtain the amicable settlement of any internal dispute that may arise in the affiliated co-operative societies or in the regional federations.

14. Development of co-operation by action supplementary to that of the State with a view to forming new co-operative societies and to extending the application of co-operation to the national dairy industry.

In general, the object of the Confederation is the technical and economic defence of this industry, particularly with a view to the conquest of the markets in competition with the great federal organisations of co-operative dairies existing in other

countries and, in accordance with the resolution of the World Dairy Congresses, promoted by the International Federation of Co-operative Dairies formed at Brussels in 1903, to give a universal and increasing impetus to the technical and scientific progress of the dairy industry.

The Confederation is perfectly informed of the development in the countries agriculturally most advanced, that is, in which the organisation of the producers has made most progress, of sanitary and economic policy in regard to milk and of the desirability for essentially agricultural countries rich in pasturelands to base their rural economy on the dairy industry, to promote hygienic methods of production, to stimulate the consumption of dairy products, to intensify the cultivation of forage plants and to encourage the increase of the dairy herds.

To indicate the importance and the results of the work of the federal organisation of Argentine producers, we may here give some data, taken from the statistics of Argentina compiled by the Ministry of Agriculture, on the development of the milk industry. While in 1914 the production of butter was 93,070 quintals and of cheese 54,720 quintals and of casein 47,180 quintals, making a total of 194,970 quintals, in 1927 the production of butter was 291,770 quintals, of cheese 161,750 quintals and of casein 133,800 quintals making a total of 587,320 quintals.

The production of butter reached its highest figure in 1923, when it was 409,470 quintals; the production of cheese was highest in 1920 when it was 247,440 quintals and the production of casein was highest in 1926, when it was 198,640 quintals. In 1928 the production of butter was 304,526 quintals, in 1929 it was 278,843 quintals and in 1930 it was 335,686 quintals.

Of the total quantity of milk employed in this industry 28 per cent. was produced in the province of Buenos Aires and 18 per cent. in that of Santa Fé. This serves to indicate the possible future development of the production, if we take account of the fact that there are in Argentina 27,065,000 head of cattle, of which one-third is in the province of Buenos Aires and that, at the time of the census taken in 1920 there were 2,751,654 dairy cattle. It may be added that the yield of milk per cow is still much lower than in the competing countries, such as Canada, Australia and the United States, but that, in view of the progress of stockbreeding and the dairy industry, now being fostered, particularly by the Confederation, it seems likely that the yield per cow will eventually reach the same level as in those countries.

In fact, Argentine agricultural experts have already demonstrated the economic advantages of improving the dairy cows by selection, and of the scientific perfecting of the industry which is possible in places where there is sufficient density of rural population and where it will be easy to increase it, as the development of the dairy industry will help to arrest the excessive exodus from the country to the towns.

E. FERRARI.

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[According to the author this work should form an introduction to the study of agricultural economy. In reality the scope of the book goes beyond the merely instructive and represents a far reaching and penetrating enquiry, following the most modern Italian and other works existing on the subject. It is characterised by a close adherence to actual economic reality and frequent references to the concrete situation prevailing in Italy and other countries, which considerably increase its value and interest. At the outset the author takes into account the fact that the economic questions relating to the utilisation of the different factors of production have already been admirably handled in the classic Italian writers. Hence he does no more than outline these problems, dwelling on the contrary on the subjects which have hitherto received less attention and in particular to the organisation of the farming enterprise and its relations to the market. There can be no doubt that in the present phase of economic confusion with all the consequences of monetary changes on the working of the farm and its returns, the study of the organisation of the farm considered in itself and in relation to market requirements is essential. The merit of the author lies in having understood this and having directed investigations mainly towards the different aspects of the marketing problem. He advises farmers to follow with more attention market fluctuations and prices as affording the soundest guide to activity. The disorder at present prevailing in the sphere of production and the want of equilibrium resulting between production and consumption are in effect largely the result of the small degree of interest hitherto taken by farmers in the intermediate stages through which products pass on leaving the farm. The well known effects of the price crisis, the consequences of which are borne by the agriculturists without any corresponding advantage to consumers, are actually due to faulty distribution, a process rendered extraordinarily difficult by the speculative activity of intermediaries. Hence a closer relation between costs and prices, and in general a more economic organisation of the farm in accordance with the changed market situation, is indicated for the class of producers who are anxious to restore balance on their farms. Among the chapters of special interest in this connection are those dealing with prices of products, the general influence of prices on the farm undertaking, the influence of prices on farm management, on the organisation of trade in products, markets, price formation, economic forecasts and their basis. With reference to the necessity of organising farmers for the purpose of marketing products, special attention may be drawn to the chapters dealing with co-operative selling. This important subject is here discussed fully and systematically. The author makes frequent references to the work of the International Institute of Agriculture (in the direction of which he was for several years engaged) and in this way he introduces the international standpoint which is one that cannot be neglected under modern economic conditions. We may further note that in the discussion of the theories the author displays a capacity for penetrating into the spirit of the different national schools of agricultural economy, especially the German and the American, and for presenting their characteristics to the reader. This insight in fact constitutes one of the most original and instructive features of the book].

TALMAKI S. S. I.L. B. : *Co-operation in India and Abroad*, with preface by Sir LALUBHAI SAMALDAS C. I. E. Basel Mission Press, Mangalore 1931 pp. 502.

[The author of this valuable hand book is not only a keen student of the progress of the co-operative movement in India and other countries, but also a worker of long experience in the field of co-operation. He was a pioneer in the co-operative housing movement in Bombay, and for the past thirteen years, the whole period of its existence, has acted as honorary secretary of the Bombay Provincial Co-operative Institute, devoting his energies especially to the educational work of that Institute.

An appreciative preface is contributed by Sir Lalubhai Samaldas, first president of the All India Co-operative Institutes' Association, which has been recently formed to promote the development of co-operation in India and held its second Conference at Hyderabad in April 1931.

The material is so arranged that the Indian co-operative movement in all its phases is seen against the background of the larger and older developments of co-operation elsewhere in the world, and the value of the book to the student is greatly enhanced by the careful sectional treatment of the subject. The eight sections include three relating to the historical, economic and legal aspects, the fourth section which comprises half the book dealing with the main divisions of the movement, and the remaining sections on co-operative federations, finance, administration, education, and a general summary of the progress of co-operation in India.

The treatment in the fourth section of the forms of agricultural co-operation in India is very full and comprehensive, while owing to the skilful use of headings it is easy to extract the information required in respect of any form in any province. The chapters relating to the societies for agricultural production and sale is of special interest, and includes a valuable summary of the difficulties in organisation of sale of products in India and of the practical remedies already initiated or suggested, such as the regulation or licensing of warehouses with issue of negotiable "godown" receipts, regulation of markets as already carried out in Bombay and Berar for cotton, provision of roads to link villages with the main arteries of traffic, as well as financing proposals. Two other very important chapters in this section respectively describe the present position of co-operative mortgage credit in India and discuss the problems of the Land Mortgage Banks the general establishment of which is now proposed in the Central Banking Enquiry Reports. Stress is laid on the importance of obtaining the capital of mortgage banks by debentures and not through deposits which may mature for repayment at a time when the capital is locked up in long term loans and is thus not fluid. The term of repayment of debentures should exceed by at least five years the maximum term of the mortgage loans. The writer seems to concur with other authorities in considering that a mortgage loan should be made over a fairly long period up to 20 years to allow of amortisation on a low rate of interest. He emphasises also the essential purpose of a mortgage loan as distinctly productive, either for redemption of former debts, purchase or improvement of land.

In addition the chapters in the third section on co-operative law, European and Indian, are instructive, and the last chapter on the general progress of co-operation in India gives an excellent survey of the present position. The book is completed by a list of Federations Institutes or Unions doing co-operative propaganda work in India, and by a short bibliography on co-operation, including Indian].

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## OF

### AGRICULTURAL ECONOMICS AND SOCIOLOGY

1932

Nº 6

#### LAND SYSTEMS

#### The Agrarian Reform in Estonia (*Continued*).

#### IV. — THE RESULTS OF THE NEW LAND SYSTEM.

##### *The Distribution of Farms and the Social Groups of the Rural Population.*

In accordance with the policy laid down by the Agrarian Law, the principal result of the agrarian reform has been the disappearance of large landed property and the increase in the number of peasant farms, a large number of persons who formerly owned no land having now obtained land and acquired economic independence. As we have already stated there were, before the agrarian reform, in Estonia (apart from the district of Petchori and Transnarovia) 51,635 peasant properties and 1,149 large estates (noble estates, estates of the Crown and of the parishes), in all, 52,784 properties.

These properties were distributed as was shown in Table II (page 157).

Up to and including 1929, 51,204 new properties had been created on land subjected to the reform as shown in Table III (page 158).

Of these properties, 6,158 were sites for buildings (*Heimstätten*) and 37,859 were settlement lands, the remainder being lands assigned for special purposes, such as schools and institutions serving to promote the development of agriculture (experiment stations, stock-breeding centres, stations for the production of selected seeds, etc.).

In addition, up to 1929, 12,855 holdings on expropriated lands were consolidated. They were thus distributed according to size :

Up to 10 hectares . . . . .	3,317 holdings
10 to 20     " . . . . .	3,315     "
20 to 30     " . . . . .	2,638     "
30 to 60     " . . . . .	3,225     "
60 to 120    " . . . . .	355       "
Over 120     " . . . . .	5         "

More than 3,100 old peasant holdings were increased by adding supplementary lands.

In consequence of the agrarian reform it is particularly the small property that has been increased, that is, the number of peasant holdings, farmed by the work of a family (without paid labour). This increase has of course, been made at the expense of the large landed property (1). If we take the number of properties in each size-group before the reform as 100, we obtain for the transformation of landed property in the different groups going up to 100 hectares the following index-numbers :

Up to 1 hectare . . . . .	177.2
1 to 5 hectares . . . . .	193.7
5 to 10       " . . . . .	245.4
10 to 20     " . . . . .	235.4
20 to 30     " . . . . .	124.1
30 to 50     " . . . . .	19.1
50 to 75     " . . . . .	6.2
75 to 100    " . . . . .	6.0

According to the results of the agricultural Census taken in 1929 there were in Estonia 133,357 agricultural holdings. They were classified as shown in Table IV (page 158).

In 1929 there still existed 194 holdings considered as large holdings, their average area being 300 hectares ; they were, in the main, holdings reserved for purposes of agricultural improvement, that is, for agricultural schools, experiment stations, seed-selection stations, and live stock improvement stations, and have been granted or rented to State or other institutions or to private individuals, but included also unexpropriated properties belonging to towns and to institutions. If to these we add the holdings of more than 100 hectares (with an average area of 210 hectares) not affected by the agrarian reform, which, before the reform, were generally included amongst the peasant farms — a part of these is represented by unexpropriated properties — the number of large properties becomes 471.

Moreover, according to the agricultural census of 1929 there existed 50,104 holdings of less than 1 hectare, of which 21,977 were in the communes, 4,822 in the towns and 23,305 in urban districts.

Side by side with the carrying out of the agrarian reform there were consolidated in execution of the Law on consolidation up to 1929 : (a) the villages with *Seelenland* in Transnarovia and in the region of Petchori (these are villages in which the fields are arranged in strips and are subject to periodical redistribution) : 384 villages with 8,418 peasant farms of a total area of 84,019.08 hectares, and (b) " holdings in rags ", or properties of which the fields consisted of scattered parcels intermixed with

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(1) Of the former large landed property, 81,593 hectares or 3.4 per cent. were not expropriated, whilst 2,346,494 hectares or 96.6 per cent. were expropriated ; of the latter area, 1,142,043 hectares, or 48.7 per cent., were covered with forests and marshes which were subjected to expropriation, 1,204,451 hectares or 51 per cent. were subjected to consolidation and to distribution for agricultural purposes. In addition, 35,711 hectares were expropriated in Transnarovia and in the district of Petchori.



parcels belonging to other properties and which often had grazing land in common : in all 137 holdings with a total area of 2,159.89 hectares (1).

The settlement holdings created under the agrarian reform are generally composed of two or three separate parcels, the arable land, the garden and the poultry run being usually together in the main parcel, while the isolated parcels consist particularly of meadows and pasture-land.

The old rented farms which existed in the form of villages on the land that became the property of the State are generally divided into four separate parcels the arable land forming the main parcel by itself, apart from the poultry-run and garden (2).

TABLE II. — *Number of Properties classified according to Size, in 1918.*

Districts	Up to 1 des- siatine (up to 1.1 ha.)	1 to 5 des- siatines (1.1 to 5.5 ha.)	5 to 10 des- siatines (5.5 to 10.9 ha.)	10 to 20 des- siatines (10.9 to 21.8 ha.)	20 to 30 des- siatines (21.8 to 32.8 ha.)	30 to 50 des- siatines (32.8 to 54.6 ha.)	50 to 75 des- siatines (54.6 to 81.9 ha.)	75 to 100 des- siatines (81.9 to 109.2 ha.)	Over 100 des- siatines (109.2 ha.)	Estates ( <i>Güter</i> )	Total
Viru . . . . .	1,171	383	349	1,210	1,456	1,984	371	77	167	172	7,290
Järva . . . . .	258	116	131	447	797	1,187	351	50	24	101	3,457
Harju . . . . .	744	645	673	1,240	952	1,908	1,027	173	209	171	7,751
Lääne . . . . .	194	434	441	901	1,238	2,069	562	66	14	148	6,067
Saare (*) . . . .	(94)	(137)	(205)	(145)	(275)	(670)	(179)	(27)	(13)	139	(*) 4,420 (1,878)
Pärnu . . . . .	489	475	627	792	730	1,307	844	237	52	73	5,628
Wiljandi . . . .	448	525	345	336	550	1,680	782	197	83	72	5,046
Tartu . . . . .	547	980	688	598	945	2,538	1,070	165	73	149	7,698
Valga . . . . .	10	20	19	36	117	875	363	111	42	36	1,129
Võru . . . . .	88	226	96	422	853	1,675	678	111	63	88	4,300
Total . . . . .	4,036	3,841	3,574	6,181	7,943	15,393	6,221	1,214	740	1,149	52,784
% . . . . .	7.6	7.3	6.8	11.6	15.0	29.2	11.8	2.3	1.4	2.2	100.0

(\*) For the Island of Oesel (Saaremaa) detailed statistics can only be supplied for 1,878 estates.

As yet there is no apparent economic differentiation between the settlement holdings of different sizes created by the agrarian reform : up to now they have in general kept the character of small holding fixed at the moment of their creation. Some exceptions are found where two or more settlement holdings have been combined to form a single farm. There are also cases where in a holding created by the reform, one finds more than one farm.

The agrarian reform has, of course, led to great changes in the social position of the rural population : the class of independent landowners has increased while that of landless persons, usually the second and third sons of agricultural labourers and of owners of peasant farms, diminished ; the tenants become owners and, in addition, a numerous class of owners of very small farms (*Heimstätten*) was formed.

Under the Agrarian Law, lands were distributed for cultivation to 11,000 agricultural labourers working on the noble estates and to 26,859 landless persons who

(1) Farms on properties not expropriated under the Agrarian Law which, under the provisions of the Law of 1926 on compulsory sale of private lands, had to be detached and registered in the name of the occupier. Up to the present only a few farms have been so detached.

(2) In like manner the "holdings in rags" and the *Seelenland* have been consolidated in execution of the Law on consolidation.

were, for the most part, persons who had taken part in the war of liberation, sons of farmers, agricultural labourers, etc.

Land for the erection of dwelling-houses (up to 1 hectare) were given to 6,158 citizens of the State. In addition, a large number of officials and employees of the State and of the communes residing in the country as teachers, doctors, policemen, officials of the autonomous local administrations, etc., also received land as a supplement to their salaries. Unfortunately there are no statistics of the number of persons who received land in this way, the lands having been assigned in block to the authorities and institutions for the employees of which they were intended. According to the data of the agricultural census of 1929, there were in the whole country 3,865 of these holdings serving as a supplement to salaries.

Under the Agrarian Law 23,023 former tenants of the noble estates became landowners.

TABLE III. — *New Properties Created up to the end of 1929 under the Law on Agrarian Reform.*

Districts	Up to 1 ha.	1 to 5 ha.	5 to 10 ha.	10 to 20 ha.	20 to 30 ha.	30 to 50 ha.	50 to 75 ha.	75 to 100 ha.	Over 100 ha.	Total
Viru . . . . .	842	684	1,718	2,250	1,500	404	40	4	12	7,454
Tarva . . . . .	668	311	757	1,212	1,048	232	33	9	12	4,282
Harju . . . . .	1,103	645	716	1,397	1,454	612	82	12	23	6,049
Lääne . . . . .	505	533	712	1,568	1,285	638	62	7	14	5,324
Saare . . . . .	619	332	680	1,746	747	114	26	14	29	4,357
Pärnu . . . . .	767	539	511	713	705	232	53	6	11	3,537
Wiljandi . . . . .	178	564	718	1,256	755	117	13	3	8	3,612
Tartu . . . . .	1,609	2,016	1,532	2,198	1,321	340	44	7	19	9,136
Valga . . . . .	339	361	363	652	339	83	19	5	3	2,174
Võru . . . . .	415	1,277	974	1,207	701	170	15	6	9	4,774
Total to end of 1929	7,045	7,362	8,736	14,199	9,855	2,947	387	73	145	50,749
Number created in 1930 and 1931 (provisio- nal figures) . . . . .	106	79	36	234	—	—	—	—	—	455
Total to end of 1931	7,151	7,441	8,772	14,433	9,855	2,947	387	73	145	51,204
Percentages	14.0	14.5	17.1	28.2	10.2	5.8	0.8	0.1	0.3	100.0

TABLE IV. — *Classification of Holdings in 1929.*

*Size-groups	Holdings situated on purchased peasant lands		Holdings situated on expropriated lands		All Holdings	
	Number	Percentage	Number	Percentage	Number	Percentage
From 1 to 5 ha . . . . .	11,187	15.7	12,269	19.8	23,456	17.6
» 5 » 10 » . . . . .	9,908	13.9	11,692	18.8	21,600	16.2
» 10 » 20 » . . . . .	15,442	21.6	19,535	31.5	34,977	26.2
» 20 » 30 » . . . . .	12,637	17.7	11,598	18.7	24,235	18.2
» 30 » 50 » . . . . .	16,432	23.1	5,703	9.2	22,135	16.6
» 50 » 100 » . . . . .	5,396	7.6	1,087	1.7	6,483	4.8
Over 100 . . . . .	277	0.4	194	0.8	471	0.4
Total	71,329	100	62,028	100	133,357	100

Thus, about 283,000 persons (including members of families) have benefited by the agrarian reform, this being about 35 per cent. of the agricultural population and about 25 per cent. of the total population.

Indirectly all the rural population has had the advantages of the lands granted to the agricultural schools, experiment stations, and agricultural co-operative societies (co-operative dairies, potato co-operative societies, co-operative societies for the working of turf-bogs, etc.) and to the autonomous administrations. Moreover, the agrarian reform has rendered it possible for the large towns and market towns to enlarge their communal lands by 9,700 hectares.

### *The Influence of Agrarian Reform on the Intensiveness of Agriculture.*

It must be remarked as a success of the agrarian reform that agriculture on the farms formerly rented from the noble estates has become more intensive. As tenants for a limited period the farmers were not, of course, able to do much towards transforming the methods of cultivation of the land, as they had no guarantee of fixity nor any possibility of obtaining credit to carry out the necessary improvements of the land or to construct up-to-date buildings. As soon as the land became the property of those who cultivated it, these obstacles were removed and personal effort was encouraged.

The same result may be noticed in the peasant farms formed on land which formerly belonged to the noble estates and were extensively cultivated. It may even be said that, in general, with the formation of small holdings and perhaps also in consequence of new market conditions, the farmers have begun to grow more grass and in part also more potatoes and root-crops for stock feeding, adopting a more scientific rotation. Moreover, it may be noted that greater attention is being given to the permanent grass-lands which were formerly let by the administrators of the noble estates for hay-making in return for the half of the hay made, and that lands formerly uncultivated are now being cultivated.

The area sown and the improvement of meadows and grazing-lands have appreciably benefited by the regulation of the drainage and the granting of land improvement credit. Up to 1929, drains have been dug and river-beds deepened at the expense of the State to a total length of 2,220 kilometres, the cost of these works amounting to 2,847,000 crowns.

Loans for land improvement have been granted to farmers for a total amount of 3,100,000 crowns.

On the initiative of private individuals the following lands have been drained :

	Arable land Ha.	Meadows Ha.	Grazing lands Ha.	Forest Ha.	Total
a) By means of tile drains . . . . .	25,600	8,400	—	—	34,000
b) By means of open ditches . . . . .	146,800	58,700	24,000	4,000	233,000
Total . . .	170,900	67,100	24,000	4,000	266,000

Before the agrarian reform the area cultivated reached its maximum in 1916. From this year onward it fell continuously, reaching its lowest level in 1919, after which it began to increase and finally exceeded by 8.3 per cent. the pre-war figure.

The areas under different crops before and after the agrarian reform are shown (as percentages) in the following table :

Years	Cereals for human consum- ption	Feed grains	Grass	Potatoes	Flax	Other crops	Fallow	Total	Cultivated Area 1919 = 100
1916 . . . . .	18.79	34.57	18.53	7.23	3.11	0.50	17.27	100	112.3
1919 . . . . .	19.86	35.15	17.56	6.83	1.91	0.40	18.29	100	100
1929 . . . . .	17.55	34.67	21.07	6.23	3.10	0.38	17.00	100	117.4
1930 . . . . .	18.97	33.88	20.69	6.83	3.26	0.18	16.19	100	120.6

From this table it results :

(1) that since 1916 only insignificant changes have occurred in the area under bread-cereals and feed-grains ;

(2) that the area under grass is continually increasing. The area so cultivated was :

168,273 hectares in 1925

182,624   "   "   1927

204,703   "   "   1929

206,305   "   "   1930

(3) that the area under industrial crops, that is, potatoes and flax, has not appreciably altered.

In general, the total area under cereals has increased, the changes that have occurred in the relation amongst themselves between the different areas cultivated being comparatively trifling.

The development of small farming has hardly changed at all the length of the season of work in the fields, but the growth of animal husbandry has rendered uniform the distribution of the whole work.

The employment of manual workers has decreased ; paid labour has been replaced by the far more productive work of the owner and at the same time the number of implements and machines used has greatly increased.

In many of the new farms the work has been much more scientifically organised according to the principles of rationalisation, but it is true that there are even more farms where the organisation of the work leaves much to be desired. This is due to the fact that the agricultural knowledge of the farmers is still inadequate.

#### *Machines and Equipment on the Farms.*

As has been already stated, the need of implements and machines has greatly increased as a result of the agrarian reform.

Thus the number of farm-carts has increased by 37.7 per cent. ; of ploughs by 36.2 per cent. ; of harrows and cultivators by 47.9 per cent. ; of seed-drills by 36.7 per cent. ; of reapers and harvesters by 71.5 per cent.

Calculated at cost price, the capital value of the implements used for tillage has increased by 42 per cent. ; of reapers and harvesters and threshing machines by

52 per cent. ; while the total capital value of implements and machines has increased by 49 per cent.

Unfortunately the national industry cannot completely supply this demand, since neither reapers and harvesters, nor tractors, nor separators are produced in the country. Although agricultural implements are produced in the country, as well as ploughs, harrows and other implements of this kind and also, in isolated cases, motor and steam machines, threshing machines, winnowing machines, and straw-cutters, and dairy implements, the greater part of the demand is met by importation.

The imports of implements and machines in recent years were as follows :

	Imports of agricultural implements and machines crowns	Total imports crowns.	Percentage of imports of agricultural implements and machines in relation to total imports.
1923 . . . . .	2,081,000	468,044,000	0.50
1927 . . . . .	1,647,000	96,420,000	1.40
1928 . . . . .	3,104,000	131,373,000	2.37
1929 . . . . .	3,175,000	122,367,000	2.58

As to the equipment of the new peasant farms, they are not yet sufficiently provided with the necessary equipment, buildings and stock, and consequently the present stage of their development cannot be regarded as final. The subsidiary loans granted by the State — 1,200 crowns on the average — and the loans for the purchase of stock (or stock obtained in kind) — 250 crowns on the average — were too trifling to provide the newly created holdings with the necessary buildings and stock.

The majority of the settlers were poor. Savings deposits lost all their value as a result of the depreciation of the currency caused by the Russian depreciation and of the depreciation that took place during the German occupation. (The deposits in the Russian savings banks have not yet been repaid). This explains why the new equipment could only be provided gradually out of income.

According to the data of the agricultural census of 1929, some of the new peasant holdings have not yet been provided with buildings at all, whilst in other holdings the buildings have not yet been completed (See Table V, below).

As to the live stock and the work animals, the new settlement holdings are not less well provided than the peasant holdings previously purchased.

TABLE V. — *Buildings on Settlement Holdings.*

Size-group	Total number of holdings	Dwelling houses		Cow-houses		Other stables		Barns			
		Number	Area	Number	Area	Number	Area	Number	Area	Number	Area
From 1 to 5 hec.	4,930	2,908	64	2,854	40	211	48	167	66	637	24
» 5 » 10 »	6,837	5,191	68	4,443	50	504	31	500	77	1,343	27
» 10 » 20 »	11,680	10,664	76	10,106	68	2,451	44	2,286	83	4,866	33
» 20 » 30 »	7,151	6,868	86	6,616	83	1,752	45	1,674	106	3,177	37
» 30 » 50 »	1,789	1,761	100	1,688	98	483	67	475	121	940	52
» 50 » 100 »	190	260	213	240	198	105	112	56	239	169	101
Over 100 »	—	—	—	—	—	—	—	—	—	—	—
Total	32,077	28,652	78	25,927	69	5,551	46	5,158	97	19,635	35

Size-group	Drying sheds		Sheds		Cellars		Bath-houses		Area occupied by buildings	
	Number	Area	Number	Area	Number	Area	Number	Area	per settlement holding	per old peasant holding
From 1 to hec. .	10	46	2,299	41	513	14	904	15	104	136
5 — 10 . . .	24	47	3,313	48	605	13	1,312	18	135	189
10 — 20 . . .	256	55	9,854	69	1,813	16	4,174	18	235	291
20 — 30 . . .	267	49	7,616	78	1,428	17	2,323	21	300	422
30 — 50 . . .	144	66	2,078	98	460	30	524	22	412	566
50 — 100 . . .	70	109	392	177	155	67	64	34	1,235	764
Over 100 . . .	—	—	—	—	—	—	—	—	—	—
Total . . . . .	771	59	25,547	70	5,034	18	9,301	19	226	424

For every 100 hectares of agricultural land there were, according to the data of the agricultural census of 1929 :

Years and kinds of live stock		All holdings		Holdings 20 to 30 hectares in extent	
		Settlement holdings	Old peasant holding	Settlement holdings	Old peasant holdings
Horses	{ 1925 . . . . .	9.33	7.71	8.42	8.55
	{ 1929 . . . . .	9.11	7.10	8.3	7.3
Cattle	{ 1925 . . . . .	20.30	20.08	18.86	21.45
	{ 1929 . . . . .	24.10	21.7	23.2	23.0
Pigs	{ 1925 . . . . .	12.93	11.36	10.34	12.85
	{ 1929 . . . . .	11.10	9.7	9.4	10.2
Sheep	{ 1925 . . . . .	30.68	24.16	25.17	27.51
	{ 1929 . . . . .	20.2	16.0	18.0	18.3

The number of agricultural implements and machines to every 100 hectares of land is shown in the following table :

Holdings and Years		Ploughs	Harrows and cultivators	Seed-drills	Threshing machines	Reapers and binders	
Old peasant holdings	{ 1925 . . . . .	28.2	23.7	0.61	1.39	3.52	2.40
	{ 1929 . . . . .	24.4	26.0	0.77	1.32	2.75	2.56
Settlement holdings	{ 1925 . . . . .	25.8	24.8	0.30	1.04	0.16	0.37
	{ 1929 . . . . .	29.0	29.8	0.44	0.29	1.43	0.62

From a comparison of the figures in the foregoing table it will be seen that the difference in equipment between the old and new farms lies in the number of agricultural machines and implements they possess. This difference is particularly striking in the case of the costly machines.

#### *Land and Agricultural Credit.*

Up to the time when Estonia became independent there were several agricultural banks in the country making mortgage loans, such as the Estonian Land Credit Bank, the Livonian Land Credit Bank, the Russian Peasants' Bank and two

Russian agricultural banks belonging to private individuals. The land credit banks were of service chiefly to the large landowners, to whom they granted loans on the pledge of their property. The sale of the peasant lands also was made through the medium of the credit banks. The Peasant's Bank was, in the main, a land settlement institution, and that during a comparatively brief period only (1907-1914). The operations of the private banks were quite trifling. The need of agriculture for short term credit was, for the most part, met by the co-operative loan and savings banks.

As a result of the great war, of the Russian revolution and of the detachment of Estonia from Russia, the system of agricultural mortgage credit was destroyed. The savings and loan banks had lost all their reserves and their deposits, as also had the commercial banks so that land and agricultural credit had to be created anew.

The people having been impoverished by the great war and the revolution, land and agricultural credit could not be organised either by private initiative or on co-operative lines and it was the State which had to take the initiative. At the commencement, the sums required to finance agriculture had to be obtained by inscribing them on the budget. Those who had the greatest need of money were, of course, the owners of the new holdings, because they had still to buy the stock necessary for cultivating their lands and to construct buildings.

It follows that one of the first tasks in the organisation of agricultural credit was to supply loans to the owners of new holdings. The effective aid began in September 1920, when building materials from the State forests were supplied on credit to persons who had obtained land. The price of the building materials had to be paid within 20 years with interest at 4 per cent.

From the first years of the agrarian reform loans were granted for the purchase of stock. From 1920 onwards the State sold the expropriated stock to the settlers on credit. This debt had to be liquidated in six years with interest at 7 ½ per cent. (reduced in 1923 to 6 per cent). As the expropriated stock was far from sufficient to supply the new holdings with the most necessary animals — horses and cattle — it was necessary to make money loans for the purchase of stock. From 1921 loans were granted by the State Bank through the medium of co-operative credit institutions. The new settler could obtain up to 500 crowns for the purchase of stock. The loan had to be repaid within six years, with interest of 7 ½ (later 6) per cent.

From 1922 building loans were granted for wooden buildings up to 60 per cent. of the cost of construction for a period of 30 years, and for buildings constructed of fire-resisting materials up to 80 per cent. of the cost for a period of 40 years. The rate of interest on these loans was 2 per cent.

In addition to the settlement loans mentioned, improvement loans were granted to the new settlers as well as to the old peasants up to 75 per cent. of the cost, repayable by instalments in 15 years with interest at 4 per cent. (now 2 per cent.).

Under the Law of 1927 all the settlement and improvement loans granted to the new settlers can be consolidated into a single loan repayable by instalments in 36 years with 2 per cent. interest for the debt and 1/2 per cent. for the expenses of administration.

Up to 1929 the above-mentioned loans were paid out of the State Bank in the order of their inscription on the Budget. By the Laws of 1925 the loans granted to settlers were treated as belonging to the settlement fund, and the land improvement loans as belonging to the land improvement loan fund.

In 1929 a settlement capital was created by a special law (5 April 1929) in order

to provide for the financial engagements incurred in carrying out the new land system and for continuing the settlement and encouraging land improvement (1).

The settlement capital is formed, in the main, of the sums received for the cultivation and the liquidation of lands expropriated under the Agrarian Law and detached from the State reserve of lands and, in addition, of the fused agricultural loans and of the interest received on them. Both the grants of loans on the lands affected by the work of settlement and the payments of compensation to the former landowners for the expropriated estates are made out of this settlement capital. At the time of the formation of the settlement capital the fund for building loans to be granted to the settlers was liquidated.

Both the work of settlement and agriculture in general have had to be financed out of State funds. For these purposes, as a complement to the land improvement loan fund, a series of other funds was formed in order that it might be possible to grant long term loans at low rates of interest for the formation of co-operative dairies, flax mills, agricultural vocational schools, experiment stations, and grain-grading stations. Loans of the same kind were granted to fishermen to enable them to buy motor boats and fishing-gear and to farmers for the sale of grain and as subsidies during years of bad harvests.

In 1930 all the special funds above enumerated were amalgamated into a single agricultural fund for financing all the engagements mentioned. This fund is administered by the State Bank for Long Term Loans.

In addition to the special funds above mentioned, the Land Bank of Estonia was formed in 1926 for the purpose of financing agriculture, and in 1927 the Bank for Long Term Loans was formed with the same object. Both these banks are State institutions.

The Land Bank gives only mortgage loans ; it has a social capital of 2,000,000 crowns and grants loans in the form of bonds :

A. Loans for definite objects :

- |                            |  |
|----------------------------|--|
| (a) for land improvement ; | } Up to 60 per cent of the value<br>of the property mortgaged. |
| (b) for building.          |  |

B. Free loans :

- |   |  |
|---|--|
| (a) for the repayment of private debts ;          | } Up to 40 per cent of the value<br>of the property mortgaged. |
| (b) for the payment of purchase<br>money ;        |  |
| (c) for the payment to heirs of<br>their shares ; |  |
| (d) for other economic purposes.                  |  |

These loans are granted by the Land Bank for a period of 5 to 55 ½ years. In the Land Bank there is a section for loans granted by the State and for the debts due in respect of purchase, which carries out all the operations relating to the settlement fund and to the land improvement fund.

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(1) Under this Law the Government of the Republic issued on 12 July 1929 a temporary order regulating settlement and creating at the Ministry of Agriculture a special settlement commission composed of three members, the functions of which were to buy lands, to subdivide them, to put them in order (improvements, construction of roads and of buildings) and to sell them. For the lands put in order the settler has to pay 3 per cent. interest, 1/2 per cent. for administration expenses and, according to the period of repayment, a certain rate of amortisation. The debt must be repaid within a period not exceeding 50 years.



The Bank for Long Term Loans is a mixed bank, that is, it finances not only agriculture but also other branches of economic activity, such as industry, navigation, and building; it further finances the autonomous administrations and the co-operative societies in the accomplishment of their special tasks. The Bank for Long Term Loans grants mortgage loans for long periods (up to 20 years) and loans on the security of bills for short terms (six months to five years). The social capital of the Bank is 5,000,000 crowns. It is principally through the Bank for Long Term Loans that the farmers obtain loans for short periods.

A large part of the farmers' requirements in the matter of short term loans is, however, satisfied by the private banks and by the co-operative banks. The number of these institutions in Estonia in 1930 was as follows:

Joint-stock banks . . . . .	14	
Municipal banks . . . . .	2	
Bank agency . . . . .	1	
		<hr/>
Total . . .	17	private banks.
Co-operative banks . . . . .	184	
Savings and loans banks . . . . .	34	
		<hr/>
Total . . .	218	co-operative credit institutions

The majority of the co-operative credit institutions make loans to farmers,

As a result of the agrarian reform, the need of credit is, of course, considerable, and the rate of interest is at present 8 to 12 per cent.

The basis of credit has, generally speaking, remained the same: the relation between the fixed capital in the peasant holdings (land and buildings) and the movable capital (stock and working capital) has not greatly changed, because the price of land has fallen by 40 per cent. in comparison with the pre-war price while the buildings, on the contrary, have become dearer in the same proportion.

### *Agricultural Production.*

According to the results of the agricultural census of 1929 there were 133,357 holdings the working of which is shown by the following table:

Gardens . . . . .	22,952	hectare
Arable land . . . . .	1,008,612	»
Meadows . . . . .	910,417	»
Grazing-land . . . . .	709,890	»
Forests . . . . .	160,104	»
Marshes . . . . .	151,941	»

From these figures it appears that of the agricultural land 33.4 per cent. was arable land and gardens, while 52.3 per cent. was meadows and grazing-land. That is why according to natural conditions, it is animal husbandry which has most chance of developing, and this appears also from the increase in the number of head of stock and the increase of animal production.

*Number of Cows and Production of Milk.*

Agricultural Year	Number of cows	Production of milk		Index-numbers		
		Total metric tons	Yield per cow kg.	Number of cows	Production of milk	
					Total	Yield per cow
1922-23 . . . . .	307,808	395,192	1,286	100	100	100
1924-25 . . . . .	321,245	497,287	1,548	104.5	125.8	120.4
1927-28 . . . . .	386,680	658,516	1,703	125.8	166.6	132.4
1928-29 . . . . .	408,850	653,025	1,617	131.4	165.2	125.7
1929-30 . . . . .	406,562	760,271	1,870	—	—	—
1930-31 . . . . .	415,897	—	—	—	—	—

*Production of Meat.*

Agricultural Years	Production metric tons	Index-numbers of production
1922-23 . . . . .	65,019	100
1924-25 . . . . .	67,233	103.4
1927-28 . . . . .	73,437	112.9
1928-29 . . . . .	73,476	113.0

The same development may be noted in the dairies and slaughter-houses, as will be seen from the following tables :

Years	Number of dairies	Quantity of milk handled: metric tons	Butter manufactured, metric tons
1924 . . . . .	272	93,180	3,629
1926 . . . . .	399	246,242	9,721
1928 . . . . .	382	305,684	12,219
1929 . . . . .	384	345,638	13,700
1930 . . . . .	383	387,989	15,549

Years	Number of slaughter-houses	Quantity of meat handled: metric tons
1924 . . . . .	18	18,288
1926 . . . . .	21	21,376
1928 . . . . .	28	27,606
1929 . . . . .	30	22,963

The development of other agricultural industries, such as distilleries; potato-flour and starch factories, tile-making and mill-construction, depends on the demand in the home market. Since the declaration of the independence of Estonia the number of distilleries has greatly diminished, as the Russian market is no longer open to their produce.

Besides the development of animal husbandry, there is a probability that the yield of cereals per unit of area will be increased.

The yield per hectare of cereals and other crops was as follows :

	Rye	Wheat	Barley	Oats	Potatoes	Hay	Flax
Average for :							
1922-26 . . . . .	969	1,041	969	851	10,329	2,985	321
1929 . . . . .	1,289	1,140	1,258	1,246	12,205	2,976	305
1930 . . . . .	1,521	1,217	1,148	1,059	12,686	3,469	331

The present yields are comparatively small, but in recent years more importance is beginning to be attached to a better cultivation of the land, by which an increase in production can be obtained.

As to the quality of the agricultural products, it has appreciably improved from year to year since control of the exports of butter, eggs, potatoes, fruit, meat, fish and flax was introduced.

Thus the quality of butter was :

Years	1st Quality	2nd Quality	3rd Quality
	per cent.	per cent.	per cent.
1925 . . . . .	53.8	44.4	1.8
1926 . . . . .	55.5	41.3	3.2
1928 . . . . .	81.7	15.8	2.5
1929 . . . . .	81.13	16.1	2.6
1930 . . . . .	87.5	10.3	2.2

The agrarian reform has rendered possible the creation of special institutions for the production of selected seeds and of experiment stations, the work of which has contributed to the improvement of the different kinds of cereals, of root crops, of fruits and grasses. Moreover, all seeds offered for sale are subjected to official control. Breeding associations provide for the improvement of the breeding of cattle and horses. The number of animals inscribed in the herd books has increased from year to year and the network of cow-testing societies has extended further. In general the total agricultural production shows an upward tendency :

	Total production (in thousands of crowns)			Index of production		
	Arable farming	Animal husbandry	Total	Arable farming	Animal husbandry	Total
Moyenne pour :						
1922-23 . . . . .	90,840	90,352	181,192	100	100	100
1923-27 . . . . .	101,640	121,318	222,958	94.0	133.1	115.6
1927-28 . . . . .	111,399	135,926	247,325	95.7	139.0	118.1
1928-29 . . . . .	106,037	150,757	256,794	72.7	134.9	105.5
1929-30 . . . . .	99,376	157,411	256,787	79.8	119.0	98.2

The net agricultural return was :

Agricultural Years	Return — crowns
Average 1922 to 1927 . . . . .	191,586,000
» 1927-28 . . . . .	213,286,000
» 1928-29 . . . . .	220,796,000
» 1929-30 . . . . .	222,765,000

Agricultural production represented 65 per cent. of the general economic production.

The proportion between the agricultural production and the number of inhabitants was as follows :

Years	Total agricultural production crowns	Number of inhabitants	Production per head of the population crowns	Index of production per head of population (1922-1923 = 100)
1922-23 . . . . .	181,183,000	1,107,000	163	100
1927-28 . . . . .	247,325,000	1,116,000	221	136
1929-30 . . . . .	256,787,000	1,114,747	230	141

The increase of the agricultural production, particularly the increase of animal products, is a consequence of the change from large farms to small farms and, accordingly, a consequence of the agrarian reform.

It is true however, that the transformation of agricultural products on co-operative lines has also contributed to this development, as it has enabled the small farms to benefit by most of the advantages which are usually the privilege of large farms.

(To be concluded).

## INSURANCE

### Agricultural Insurance in Bulgaria.

*Hail Insurance.* — Hail insurance is effected in Bulgaria exclusively by the insurance section of the Central Co-operative Bank of Bulgaria at Sofia. This bank was established by the Law of 26 December 1910, amended and completed by that of 19 March 1925 published on 21 March of the same year, constituted on the basis of optional insurance and of mutual aid.

During the period from 1895 to 1903 the organisation of hail insurance had been founded on the principle of compulsion by a law enacted in the course of 1859. This latter form of insurance was extended to all crops except tobacco. Premiums were established for all parts of the territory of the State and for all the crops on the uniform basis of 5 per cent. of the land tax. The State contributed to the compensation fund by means of an annual subsidy of 500,000 *levas*. This form of insurance was applied over a period of eight years, but as it did not yield the results anticipated it was abolished in 1903.

In 1910 a new law was introduced to assist the farmers by establishing the organisation which is now in force with the modifications made necessary by circumstances, especially by the consequences of the war, *viz.*, devalorisation of the *leva*, increase of taxes, economic upheaval, etc.

Hail insurance, as thus organised, is not subject to the law of 1 May 1932 relating to supervision of private institutions of insurance, which amended and completed the law of 26 July 1926 by which State supervision had been introduced for private insurance societies. The law in fact does not apply to public insurance institutions, existing in virtue of special laws.

The hail insurance section of the Central Co-operative Bank must however report each year on its activity to the Minister of Agriculture and Public Lands, and is under the control of this Ministry.

In connection with this insurance institution there is a Council consisting of (a) one member chosen from among the insured persons in each district and elected for a period of three years by the Council of that district; (b) the Chief of the Agricultural Service at the Ministry of Agriculture and Public Lands in the capacity

of State Commissioner. This Council is summoned to meet at least once in the year. The decisions of the Council are submitted in advance to the approval of the Ministry of Agriculture. The institution is expected to carry out the decisions of the Council relating to any modifications of the general conditions of insurance, entrance fees and changes relating to the franchise or minimum limit below which compensation is not given.

Except in cases expressly regulated by the law in accordance with which the Institution has been established, the institution itself subject to the approval of the Ministry of Agriculture fixes :

- (a) the conditions of insurance ;
- (b) the method of taking up insurances ;
- (c) the method of estimating losses ;
- (d) the amount of the entrance fee ;
- (e) the annual premium to be calculated on the basis of hail risk as affected by geographical considerations and the type of crop ;
- (f) the limits within which compensation is paid.

The funds of the institution must be devoted exclusively to these objects and are under separate management.

The foundation capital of the institution has been fixed by the law at 30 million *levas* paid up by the State. Up to the present only one million *levas* have been paid up (1). Apart from these funds, the law has established that this institution is to receive every year from the State a subsidy of 8,500,000 *levas* as a minimum. During 1930 only 2,000,000 *levas* were paid (2).

To meet payment of compensation during the year and administration expenses, there are set aside (a) the premiums received in the course of the year ; (b) the subsidies granted by the State ; (c) the interest on the funds. The annual subsidies granted by the district councils amounting to at least one per cent. of their budgetary receipts serve to reduce the premiums of the insured persons of the corresponding department. If the financial sources indicated, after deduction of administrative expenses, are not sufficient to cover at least 80 per cent. of the compensation payments due, 50 per cent. of the reserve funds may in accordance with the law be used to complete the necessary percentage of the compensation payments. If the sum obtained in this way is not enough for the purpose, the Insurance institution shall contract a loan with the Agricultural Bank or with the National Bank of Bulgaria for a sum equal to the deficit. This loan must be covered by the surpluses first accruing in the following years. A second loan of the kind can only be contracted after the first is amortised, even if the sums intended to meet compensation payments as indicated above are not sufficient to cover 80 per cent. of the payments due.

The reserve funds of the insurance institution consists of: (a) surpluses remaining after the payment of the compensation amounts and administrative expenses, (b) entrance fees, (c) certain penalty payments which in accordance with the law are passed over to the reserve fund ; (d) donations, bequests, etc.

At the Central Co-operative Bank there is organised a regular service for observation of hailstorms as well as of the resulting damage. This service works independently of the Meteorological Service. Apart from the information published every year in the Bank report, a publication in the Bulgarian language appeared in 1931 relating to the organisation and activity of the Central Co-oper-

(1) Report of the Central Co-operative Bank of Bulgaria for 1930, p. 32.

(2) *Ibidem*.

ative Bank from 1911 to 1930 (*Dwadesset Godischnik na bulgarskata Zentralna Kooperativna Banka Sofia*) containing much interesting information and tables referring to hailstorms and damage from hail during the period indicated.

For the development of hail insurance, the Central Co-operative Bank has organised an active propaganda of a popular kind, carried out especially on 27 April of each year. This day has been called Hail Insurance Day.

The Central Co-operative Bank publishes yearly a report of its working containing some interesting information either in regard to the credit section or to the insurance section.

In respect of hail insurance, very useful tables are given by the Central Co-operative Bank of Bulgaria relating to the position of hail insurance from different points of view, as well to the development of hail insurance in Bulgaria. These tables include: (a) a table on the number of insured persons in relation to the communes in which the insured persons live; the whole divided by departments; (b) a table on the distribution of the sum insured per crop, in relation to the premiums, the compensation payments, the area insured and that affected by the hail; (c) a table relating to the dates of hailstorms as well as the number of communes affected; (d) a table of profits and losses of the section of hail insurance during the year in question, and finally (e) a table on the development of hail insurance.

The following are some data for 1930:

Number of insurances	Number of insured communes	Sums assured	Premiums	Number of persons compensated	Compensation payments	Annual State subsidies	Grants from district councils	Area insured	Areas affected
		levas	levas		levas	levas	levas	decares	decares
76,310	1,962	944,843,530	30,445,043	12,525	21,287,160	(x) 2,000,000	235,068	2,026,541	141,040

(x) Out of the annual State subsidy fixed by the law at a minimum of 8,500,000 levass, as has been said, only 2,000,000 levass have been paid according to the Report of the Central Co-operative Bank.

This note on hail insurance may be concluded by a table giving a summary of hail insurance in Bulgaria from 1911 to 1930.

Value of 100 gold fr. in Bulgarian levass	Years	Insured persons	Insured communes	Sums assured	Premiums	Persons compensated	Compensation payments
				levass	levass	levass	levass
100 —	1911	3,444	491	1,120,490	134,865	517	126,974
100 —	1912	17,548	1,091	28,255,390	630,780	2,527	1,037,726
100 —	1913	25,028	1,198	39,328,450	921,183	3,993	869,761
100 —	1914	30,316	1,290	37,151,420	1,181,514	6,292	1,623,960
128.44	1915	35,552	1,413	41,742,045	1,326,357	6,713	1,227,236
136.92	1916	36,389	1,401	41,799,380	1,541,386	8,400	1,689,714
173.92	1917	38,765	1,402	65,537,950	2,114,133	4,083	934,634
166.54	1918	34,304	1,308	86,450,740	2,862,874	5,681	2,849,578
466 —	1919	31,064	1,243	123,316,620	4,805,292	5,672	4,155,394
1,243 —	1920	12,273	989	60,824,470	3,082,259	3,288	3,965,351
2,176 —	1921	9,467	926	74,622,260	3,459,379	1,950	2,974,103
2,896 —	1922	7,713	893	141,542,120	5,048,284	2,211	6,029,896
2,446 —	1923	8,739	846	155,398,920	5,731,805	3,959	16,101,283
2,685 —	1924	13,548	1,002	186,557,150	9,912,965	3,082	4,800,931
2,685 —	1925	26,638	1,286	386,825,340	14,383,605	4,988	9,328,175
2,685 —	1926	32,524	1,600	446,777,660	15,934,322	7,701	22,990,233
2,685 —	1927	56,376	1,794	817,464,660	29,252,307	7,856	14,986,472
2,685 —	1928	71,068	1,936	975,005,340	33,383,881	4,987	9,284,531
2,685 —	1929	63,521	1,893	661,573,410	22,971,154	10,425	22,670,448
2,685 —	1930	76,310	1,962	944,843,530	30,445,043	12,525	21,287,166

*Livestock Insurance.* — Livestock insurance is organised on the basis of the Law of 26 December 1910 as amended by the law of 27 February 1935 published on 17 March of that year. As for hail insurance there has been formed in virtue of the law mentioned a livestock mortality and accident insurance section of the Central Co-operative Bank of Bulgaria.

This insurance is optional and dependent on the principle of mutual assistance. Like hail insurance it is subject to the Law on the supervision of private insurance companies of 26 July 1926, completed by the Law of 1 May 1932.

Membership of the section is open to any livestock insurance association constituted in accordance with the provisions of the law organising livestock insurance, such association having accepted the livestock insurance regulations prepared by the Section and approved by the Ministry of Agriculture and Public Lands. The insurance associations are formed and carry on activity in accordance with a constitution drawn up and accepted by the General Meeting of founder members and confirmed by the Section. The livestock insurance section exercises a control over the activity of local associations. It has the right to verify their accounts and to see that they observe the provisions of the law and of the model statutes. The associations are exempt from the obligations imposed by the law on co-operative associations in respect of registration, publication of their proceedings and reports of working.

The associations are represented at the Bank by the council of the Section which consists of

(a) one representative of each district chosen from among the presidents of insurance associations and by the associations themselves. The election is carried out in accordance with the terms of a regulation confirmed by the Minister of Agriculture ;

(b) a representative of the Ministry of Agriculture and Public Lands appointed by the Minister ;

(c) the administration of the insurance department and the Chief of the livestock insurance section.

The Council examines the report of the Section, and it rests with this body to decide if it is advisable to amend the constitution, and as to the measures essential to the development of the insurance scheme. It also falls to the Council to examine and pronounce on any representations made by associations that are either not admitted or excluded from the section. The Council fixes the amount of the premium. Decisions are carried out by the section after ratification by the Minister of Agriculture.

The insurance premium is fixed by decision of the insurance section, confirmed by the Ministry of Agriculture. Ten per cent. of the premium is assigned to the reserve fund of the Section and the remainder is used to pay that half of the compensation payments which falls upon the associations. Full payment of sums in compensation which have to be paid out in the course of the year to insured persons is undertaken by the section, one half of such payments falling on the associations, while the other half is met by the section. If the portion of the payments falling on the associations cannot be covered by the annual premiums, the deficit is the first charge on the reserve funds of the associations, although not more than two-thirds of this fund may be utilised for the purpose. If however there is still a deficit, it becomes a first charge on the reserve fund of the section.

The reserve funds are constituted as follows :

A. The reserve fund of the section itself is formed from : 1. The existing reserve fund of the Section ; 2. the State subsidy ; 3. ten per cent. of the annual insurance

premiums ; 4. the interest on the foundation capital of the section ; 5. the interest on the reserve fund itself ; 6. five per cent. yearly on the receipts from the contagious diseases fund ; 7. one per cent. on the livestock export charge ; 8. grants given by the general councils ; 9. fines and other receipts.

The following charges are covered by the reserve fund of the the section : half the compensation payments made for deaths of stock or for compulsory slaughter ; the administrative expenses of the section ; and the deficit in the case when more than two-thirds of the reserve fund of the associations would be necessary to meet the compensation payments.

B. The reserve fund of the associations is constituted as follows: 1. The existing fund of the associations ; 2. the interest on this fund ; 3. the surplus of the annual insurance premiums ; 4. five per cent. charge on the sums coming from the rent of property belonging to the funds for stock raising ; 5. the fines imposed by the administrative council of the associations.

The State has granted to the section a sum of 15 millions of *levas* as foundation capital. In accordance with the law the section receives from the State an annual subsidy which may not be less than the sum of 2,500,000 *levas*. During 1930 only one million *levas* was paid (1). If this subsidy is insufficient to cover the share of the compensation payments for which the section is responsible, it is supplemented by the State.

In the annual report for 1930 of the Central Bank the desire is expressed that the law on livestock insurance should be amended and that compulsory insurance of livestock should be introduced.

The Report of the Central Co-operative Bank contains as for hail insurance various tables which give a complete idea of the position and development of livestock insurance. In the first of these is given the number of the associations, the membership and the number of head of livestock insured by district. Another table presents statistics of the diseases from which the insured animals have died during the year under review. There is also a table showing the profits and losses of the livestock insurance section for the financial year under consideration, and finally a table on development of livestock insurance.

The following is a table giving certain statistics for the year 1930:

Number of associations	Number of members	Oxen and cows	Buffaloes	Horses	Mules	Asses	Goats	Total head
840	31,501	41,700	12,392	11,710	148	187	206	66,403

Sums assured	Premiums	Compensation payments	Head of stock on which compensation was paid	Proceeds of sales of hides, etc. of these animals	State subsidy	Grants from district councils
levas	levas	levas		levas	levas	levas
845,958,240	6,508,640	4,513,620	1,585	920,020	(1) 1,500,000	55,662

(1) Out of the annual State subsidy fixed by the law at a minimum of 2,500,000 *levas*, only 1,000,000 *levas* have been paid up according to the Report of the Central Co-operative Bank.



As regards developmebt of livestock insurance in Bulgaria the following is a table relating to the period 1912 to 1930:

Value of 100 gold fr. in Bulgarian levass	Years	Number of associations	Number of members	Number of insured animals	Sums assured levass	Premiums levass	Head of stock on which payments were made	Proceeds of sales of hides etc. of these animals levass	Compensation payments levass	Average compensation paid levass
100 —	1912	3	35	93	17,600	191	1	—	126	—
100 —	1913	3	22	78	13,695	314	8	175	861	107
100 —	1914	34	629	2,332	355,157	4,769	54	1,138	6,780	125
128.44	1915	79	1,025	4,167	817,390	9,566	147	7,010	22,338	155
136.92	1916	25	380	1,369	354,370	3,952	59	3,793	9,625	163
173.92	1917	24	567	1,554	690,690	7,331	34	3,690	9,319	274
166.54	1918	19	438	1,663	1,283,680	14,700	55	9,146	26,161	475
466 —	1919	25	624	2,346	4,374,620	69,133	181	33,135	91,723	506
1,243	1920	20	850	3,082	11,723,300	192,849	132	80,533	185,296	1,408
2,175 —	1921	26	700	2,461	10,298,290	179,098	118	70,462	315,220	2,671
2,398 —	1922	31	821	2,821	12,661,450	196,011	120	96,774	217,156	1,809
2,446 —	1923	43	1,047	3,296	15,956,650	200,291	96	87,531	296,194	9,085
2,685 —	1924	94	1,944	4,605	26,531,000	433,311	185	103,703	546,697	2,955
2,685 —	1925	208	4,463	10,974	56,163,900	885,608	360	251,394	1,290,200	3,584
2,685 —	1926	385	9,877	22,949	129,102,030	2,569,940	706	428,798	2,118,816	3,608
2,685 —	1927	580	20,618	48,016	251,793,800	3,989,313	1,500	796,436	4,444,516	2,962
2,685 —	1928	663	29,920	69,007	337,028,900	6,228,420	2,142	997,392	5,726,636	3,143
2,685 —	1929	685	31,396	69,598	343,829,500	6,208,680	1,883	1,001,162	5,150,409	3,267
2,685 —	1930	840	31,501	66,403	345,958,240	6,508,740	1,585	920,020	5,613,620	3,427

F. A.

## ECONOMIC AND SOCIAL CONDITIONS OF THE AGRICULTURAL CLASSES

### Rural Women's Organisations and the Agricultural Crisis.

A one-day Conference was arranged in London on 27 May by the Liaison Committee of Rural Women's and Homemakers' Organisations, a women's international Committee with headquarters in London, representing about 50 organisations. The object was to discuss the position of the countrywoman in the world economic crisis, the extent to which she is specially affected and the special services she can render towards its eventual remedying. The meeting was well attended and in addition to a number of visitors included representatives of the organisations and associations of rural or farm women in the United States of America, Germany, Estonia, Norway, Sweden, Finland, Australia, New Zealand, Kenya, Union of South Africa, etc.

Among the papers and addresses contributed (1) special interest attached to the following:

(a) The Position of the Countrywoman in the World Economic Crisis from the Old World Point of View, by Frau Kuessner Gerhard, president of the Country Housewives' Association of Germany (*Reichsverband Landwirtschaftlicher Hausfrauenvereine*); (b) The Position of the Countrywoman in the World Economic Crisis from the New World Point of View, by Miss Eunice H. Avery, Lecturer on international subjects, United States of America, and (c) The International Significance of the Work of Countrywomen by Mrs. L. E. Howard, Chief of the Agricultural Service, International Labour Office, Geneva.

(1) Material taken from reports communicated by the Liaison Committee of Rural Women's and Homemakers' Organisations, 26 Eccleston Street, London.

A brief summary of the chief points in these three addresses follows :

(a) After indicating the main features of the crisis as affecting the farmers of the Central and Eastern European countries, Frau Kuessner Gerhard proceeded to discuss the special position of the farmwomen, more particularly in Germany. Morally, the present situation is perhaps felt even more acutely by the woman as she is usually more attached to the soil than the man, and realises more vividly than he the evils of unemployment and detachment from the land that now threaten to be almost inevitably the lot of the next and future generations.

On the material side too the crippling effects of the shortage of money are even more acutely felt in the farm household, which is the woman's province, than on the farm which is the joint concern of both and this for the following reasons :

1. — There is a tendency to incur the least possible expenditure for the household which, although it fulfils the important part of feeding and clothing the farmer and his family, is none the less usually regarded as not productive, in the sense that it yields no items on the receipts side of the balance sheet. Hence any ready money available is spent by preference on the farm, and all purchases of labour saving household appliances are deferred.

2. — Marketing of produce for which by custom the woman is responsible, (eggs, dairy produce etc.), is usually less well organised than the marketing of field crops, and requires proportionately more expenditure of time and energy.

3. — Owing to the crisis there is more call on family labour, and the woman's hours of work in field and cowshed, and generally on the farm, are in consequence longer. In the course of an enquiry carried on recently in Württemberg by Prof. Munzinger, it was found out that the hours of work on a number of farms in South Germany were on an average 12 to 14 for the men, and 15 to 17 for the women. An investigation made by the *Union Centrale des Associations Rurales Féminines* has brought out the fact that in almost all countries there is a great increase in the number of women working in the fields even in countries where it had not been the general custom previously. In addition, in connection with the recent development of more precise and scientific methods of farm accounting it is of interest that the work of book-keeping, on the small or family farms, is usually undertaken by the farmer's wife or daughter.

On the other hand the crisis, by bringing about changes in farming methods, is affecting the woman in another way. In many districts the most important farming receipts now come from pigs, dairy products and eggs, in other words from the departments under the care of the farm woman.

As regards steps taken to remedy the general situation, the work done by the the Country Housewives' Association of Germany in organising market stalls in country districts and shops for country women's produce has been of great value. The stalls are under the management of the local associations and are open twice or three times a week for sale of local produce. All goods are marketed under strict regulation in regard to standard and quality and with careful attention to market requirements. The shops which are opened in centres served by country districts are owned by the Association (*Reichsverband*) itself, and are managed entirely in the interests of the countrywomen producers of poultry products, fruit, vegetables, cheese, preserves, etc. By special concession of the Ministry of Finance, taxes are levied on these shops at a lower rate.

In Germany it is becoming the practice for the experienced country housewife to undertake the training of young girls and women for household work on the farm. Such training is carefully organised on a two years' basis with final examinations.

In addition in some districts there are courses for young women in farm and farm household work which include instruction in the keeping of farm accounts.

(b) It is well known that the farmer's standard of living in the United States is high as compared, speaking generally, with European conditions and the farm woman, besides enjoying more social advantages owing to the possession of a car, etc., is usually equipped with labour saving devices of the most modern type. In addition the great extension of broadcasting has effectively broken down any remaining isolation. An interesting result of the broadcasting instruction was noted by the speaker. Special talks are given to women on diet, cooking and general household management, and it is stated to be in consequence of these that the American farm dietary has come to include a more adequate proportion of the fruit and vegetables grown on the farm.

The effect of the agricultural depression and the low prices paid for agricultural produce is undoubtedly in the States to give a certain advantage to the owner of the small farm. It is beginning to be realised that even when no profits are to be made, farming provides, and is the only industry so providing, subsistence for a man and his family. Miss Avery gave an illustration of this truth from the story of a district in Arkansas, where the effects of the agricultural depression had been aggravated over a period by a severe drought. On the advice of the County Visitors, or Government Advisers in agriculture and domestic science, the inhabitants decided to plant vegetables and fruit rather than wheat and maize, thereby ensuring crops that could be watered by hand, and attended to by the women and young people, and would supply the means of subsistence. A year later the village could not only feed itself but preserved food stuffs were available for future use and for sending to other districts.

Speaking generally, there is a strong movement in the agricultural districts of the States towards subsistence farming as a remedy of the evils arising out of the crisis, and in this movement the country women are taking a large share and can do much to ensure success.

(c) In dealing with the subject of the international significance of the work of countrywomen, Mrs. Howard stressed the possible activities of associations of countrywomen in addition to those of individual farm women in the direction of solving problems arising out of the world crisis. Among the many factors in the present agricultural situation, the following may be selected as basic: 1. the great and disconcerting instability of financial and economic conditions; 2. the technical changes of a far-reaching character taking place in some branches of agricultural production; and 3. the change in the methods of attack on social problems due to the influence on outlook in regard to social and labour problems of the accumulated research and investigation work of previous decades.

To meet the unstabilised economic conditions, it is possible that farm women, acting on co-operative principles, might often increase cash takings by initiating the marketing of their "side-line" products. Thus in Canada, the Saskatchewan Egg and Poultry Pool, a co-operative organisation constituted almost entirely of women, was in 1928 enabling about 18,000 farmers' wives to supplement the farm income. Various minor schemes of this type might be attempted, but the individual is seldom in possession of all the facts governing her local market, and advice about local marketing opportunities, location of booths, etc., is precisely the work which can be undertaken usefully by the local association. The rural women's organisations are in a position also to arrange for any necessary instruction on the preparation and preservation of food, with special attention to the utilisation of the products of the farm and of material which may otherwise tend to be wasted. It is possible that some

interchange of practical information under this head between different countries might be useful, together with some comparison of the facilities for provision of instruction. Such instruction is in every modern country an essential contribution towards the utilisation of spending power, and a link in the chain of economic effort. Resolutions on the subject might from time to time be with advantage drafted by the farm women's organisations and forwarded to competent bodies, such as Government Departments or Chambers of Agriculture.

The changes in agricultural technique caused by the introduction of machinery, the experimental work in animal husbandry, etc., are likely to be permanent and it is unlikely that there will be any general continuance of pre-war technique in farming. The use of machinery is of supreme importance; there is still however in many regions an unwillingness to adopt machine methods. It is suggested that if the countrywomen — through their organisations in such districts — were induced to accustom themselves to the use of simple household machinery, and would urge the purchase, when possible, of the proper household tools, they would as it were create a modern outlook within the farmhouse, and the introduction of the simple machine for farm use would doubtless follow.

As regards the third point, — the importance of definite scientific information accumulated over a period of time as affecting the attitude towards and action taken in respect of social and labour problems, — there is still a noticeable lacuna, observed by the International Labour Office, in regard to such information on the place and work of women in agricultural and rural life. The rural women's organisations in the different countries would do a great service by organising where possible first-hand local enquiries on such subjects as: division of the countrywoman's day between her diverse duties; the actual household budgets of rural households with a view to ascertaining how far the present earning capacity of agriculture is sufficient for the daily needs of the workers. Some work might even be done towards clearing up population questions. Statistics relating to the female part of the agricultural population in different countries are seldom comparable, as the definitions adopted for the census returns vary, and in fact often vary also for the succeeding censuses carried out in the same country. Sound statistical information is the basis of all modern scientific social effort, and it is greatly to be deplored that any obscurity whatever should exist in regard to such subjects as the classification of groups of women in rural populations, the needs of rural households, or the volume of professional work contributed by the farmer's wife or daughter to the carrying on of the farm business.

Speaking generally, the problems appear in similar forms in many countries, and the principles which apply to their solution are internationally applicable simply because the household and the farm (*i. e.* the home and the profession) are so closely allied in every country. This being so, an active interchange of information should be very useful. Country women's organisations might well specialise in the direction of interchanging information from country to country. The establishment of small international working committees might be considered, to deal with specialised problems, *e. g.*, a preservation of food committee, a household equipment committee, an education committee. An international committee on the social problems arising out of farm household work would be especially valuable. In other words a sustained and organised effort to interchange information on *selected* topics will lend outstanding importance to any opinions which organised country women may wish to enunciate, since such a clear basis of accurate facts from a series of countries is still, in spite of the efforts of international bodies, wanting in many international fields.

In conclusion there was a general consensus of opinion among those attending the Conference that any solution of the problems arising out of the present crisis must largely depend on a new conception, at once simpler and more efficient, of the standards of living, together with a fuller co-operation in the promotion of the general welfare, and that these elements are being and should in the future be increasingly supplied by women, and in particular by country women in association.

C. H.

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[The 40th volume has just been published of the International Yearbook of Insurance founded in 1893 by Gustav J. Wichniowsky. This publication contains most useful information of the insurance societies operating in 57 countries including 31 in Europe. For a large number of societies, the Yearbook publishes the statements of accounts for 1929-30. In the preface the author states that he was obliged this year, in consequence of the increasing gravity of the general economic crisis, to omit the general considerations in regard to insurance which in the previous editions appeared at the beginning of the sections devoted to each country. On the other hand it has been possible to introduce additions and improvements in respect to the European countries].

BOWMAN, Isaiah: The Pioneer Fringe. American Geographical Society, Special Publication 13. New York, 1931.

[The volume is divided in two parts: Part. I composed of 7 chapters deals with pioneering in general, its historical and economic background, its hardships, its gains and losses, and the degree to which the advent of machinery has facilitated the irresistible trend towards "the border". The author states that no rule has been found to account for the ways and manners of pioneering. In fact, he says "The reasons that impel men to seek the border, are as varied as humanity itself". Until comparatively recent times, pioneers looked for the best land they could find and moved on until they could settle down. In the last few decades science has taken a hand in helping the work of the pioneer. Most of the best land available, Mr. BOWMAN says, has already been occupied by people who have developed it in a profitable way. The trend beyond the frontier continued, however, and scientific methods came into play and the "second wave of pioneering" began. To-day there is a sort of science of pioneering which interests Governments themselves. The failures of former times are lessened by scientific mapping of available land, introduction of machinery, ease of communications either by rail or motorcar. The railway has played a very important part in facilitating the work of the pioneer: a work which continues in spite of difficulties. "With a complacency and an ignorance that matches anything in the history of thought which we now condemn", says the writer "the end of pioneering is announced. No more of its left to do anywhere in the world, said the head of a Government Bureau only two or three years ago. A historian takes a bookful of words to prove the same thing with equal conclusiveness. An economist tells us that we need no more land: witness the millions of arable acres now left untilled in regions of close settlement in the United States. The answer to this statistical conclusiveness is made not by a few wandering bands of chronic pioneers, but by a host that numbers millions". The land invites the willing to work and dare.

All this the "Pioneer Fringe" shows with a careful analysis of conditions where the work of land seekers has been active in the very hard beginning and is active today in the parts of the world where there is land to be conquered: be it in frozen regions which until recently were believed inaccessible and useless to man, the virgin forests of Brazil, or the hot marshy regions of equatorial Africa. All races of men under all latitudes are active at this work of conquest which nothing seems to be able to stem.

From these considerations of a general character, the author passes to an analysis of the actual work of pioneering in the United States, Canada, Australia, South Africa, Siberia, Mongolia and Manchuria, and lastly in the South American Hinterlands. This constitutes Part II of the book and consists, like the Part I, of seven chapters.

The pioneer conquest of the great American West, which is dealt with in Chapter 8, is naturally mostly of a historical character, as the conquest is now completed. Chapter 9, dealing with the Canadian Fringe of settlement, gives the reader a vivid picture of the advance of the pioneer towards the sub-arctic region. The part played by the Railway in fostering the conquest of this part of the American Continent is illustrated both by text and reproduction of very interesting photographs. Australia and Southern Africa come next under the painstaking observation of the writer, who in chapters 10 and 11 gives a clear idea of what has been done, and of the prospects for the up-to-date, machine-helped pioneer, particularly in Australia where enormous tracts of land are still available.

After a survey of pioneering in Siberia (Chapter 12) the author takes up the examination of pioneering conditions in Mongolia and Manchuria. The title to this chapter — A Modern Invasion — is indicative of the fact that the races which have started their move "beyond the border" are in many ways new to the work of pioneering as now understood. The possibilities of both Mongolia and Manchuria appear quite considerable. But we are just at the beginning of an undertaking not devoid of dangers, of potential conflicts.

The last chapter (14) deals with the South-American Hinterlands. The author is once more on familiar ground and the subject is treated with exhaustive amplitude. The peonage system, the survival of the plantation system in some important parts "because it is economically best" in some places, "while in other places it is a device employed by the landowners for maintaining an essentially aristocratic system based upon land"; the means of access to already settled sections and to the railways, the latifundia in Chile, the haciendas in Peru, conditions in Ecuador and Bolivia, are interestingly described to the reader in what we might call the first part of chapter 14. The second part of the same chapter deals with the "Tropics as a Pioneer zone". The Author finds that the white man cannot possibly live there even though science may help him to conquer the many deadly diseases proper to the Tropics.

Conditions in Northern Paraguay, the Gran Chaco of Bolivia, the Matto Grosso in Brazil, the Piedmont Border in Northwestern Argentina are next examined and illustrated. The chapter ends with a detailed account of conditions in Patagonia, "no longer world's end, a no-man land, a symbol of remoteness".

The volume is full of excellent photographs illustrating the work of the pioneer in all countries and greatly adding to the value and interest of the study, which is perhaps the most comprehensive work of its kind now available for the student of this subject].

Water and Grass: A Study in the Pastoral Economy of Southern Europe, by E. H. CARRIER, M. A., M. Sc., F. R. Hist. S. Christophers-London [1932].

[The book under review, in the words of its author, mainly "deals with the migratory pastoral industry, together with the economic, social and political problems to which the seasonal wanderings of flocks and herds and their human attendants give rise". The story of the "Great Transhumance" is told separately for each country; in its development from ancient to modern times; the different types of pasture are discussed and a review of the pastoral industry in the different countries of Southern Europe "in order of their historical importance" follows in each case the discussion of the social and economic side of the problem. This discussion and review begin with Italy and ancient Rome. Conditions in the various countries of Southern Europe, from Spain to the Balkans, are then examined and the special features of the pastoral industry in each country are dealt with in detail.

A bibliography and a glossary of pastoral terms greatly add to the usefulness of this important study].

GUMPERZ, Julian: Die Agrarkrise in den Vereinigten Staaten (Veröffentlichungen der Frankfurter Gesellschaft für Konjunkturforschung, herausg. von Dr. Eugen Altschul, N. F. Heft 2). Hans Buske Verlag, Leipzig, 1931, pp. XII-182.

[As the Editor of the series of publications of the Society points out in his Foreword, the present economic situation is rendered especially grave by the simultaneous development of an industrial and an agricultural depression, and the problem is to determine the causes and the conditions of this coincidence. The agricultural situation in the United States is especially interesting from this point of view, because it is there that the capitalistic transformation of farming, which turns the farmer into a

business man, has gone far enough to involve agriculture in all the vicissitudes of the business cycle. This transformation of agriculture is more or less universal, but in other countries traditional forms have greater vitality and the process is not so far advanced. As Dr. Altschul puts it, the book under review "not only describes the complicated process of transformation in American farming, but also represents a contribution to the theoretical analysis of a definite trend of evolution which, from the economic and social point of view, intimately concerns the European economic system. What we observe here, is not an isolated phenomenon, but a typical case which comes about necessarily the moment agriculture finds itself involved in the general process of capitalistic development".

The scheme which the writer applies to the interpretation of the agricultural evolution of the United States, is entirely based on the acceptance of the Marxist conception of the inherent antagonisms of capitalism as a social and economic system. In the United States, the turning point was reached with the exhaustion of the reserves of land which was available free to potential settlers. While, up to the close of the last century, land was the reservoir which absorbed the surplus of urban labour, now it is industry that is called upon to absorb the surpluses of rural population. With the penetration of capitalistic methods into the agricultural industry, the increase in the average size of holdings and growing mechanisation, independent family farming, formerly the foundation of the social and political system of the U.S.A. tends to lose ground, and labour released by this process has to seek employment in the industries and other urban occupations. The family farmer, now faced with large capitalistic concentration both outside and inside agriculture, finds himself in desperate straits, and all efforts of the United States Government, designed to help him to organise for resistance, mostly by means of co-operation in marketing, are of no avail as not removing the real cause of his weakness, his inferiority as a producer.

"The crisis through which American farming is now passing is a crisis of the small family farm which is no more able to withstand the onslaught of the industrial revolution in agriculture": such the diagnosis of the situation by Dr. Gumperz.

The high degree of commercialisation of American agriculture which puts 80 per cent. of its output on the market, makes it particularly sensitive to changes in prices, and enables even a slight fall in the price level to have disastrous effects upon the farmer. And as there exists in the United States a very large class of farmers whose economic position is generally precarious and who live on a marginal income, a depression such as the present is bound to be acutely felt and to cause great distress.

The technical progress of agriculture brings about a great increase in the productive capacity of American farming; and this increase would appear to the writer to mean that "the Malthusian doctrine of population and the Law of Diminishing Returns are practically and theoretically rendered invalid": a point which may be conceded only in part. In fact, while such an increase of productivity, if continued indefinitely, will solve the population problem, it will in no way affect the validity of the Law of Diminishing Returns as a theoretical proposition.

To the writer following as he does the Marxian scheme of evolution, the present crisis, in spite of the sufferings and losses it causes, appears in the light of a constructive process. "While capitalism destroys the obsolete methods of agricultural production, it converts agriculture, which hitherto had been the staunch bulwark of the old, into a bearer of progress. The human race stands on the threshold of the greatest historical decisions". "What hitherto had appeared, in spite of its real importance, a rather minor detail of the great picture of economic processes as a whole, namely the end of the manufacturing stage of agricultural capitalism, will now become an event which, when developed to its ultimate consequences, will change the life of the population of this planet completely and in every domain."

One may not always agree with the views of the writer of this interesting book as to the origin and nature of the processes he describes, but the reader will gain a deeper insight into the social and economic background of the crisis, only too often hidden from the eye of the student by its external manifestations. Whether the dogmatic scheme of the writer is accepted or not, the fact remains that we are in the midst of a process of structural changes in agriculture, and we must seek for a synthetic view of this process].

I salari nell'agricoltura tratti dai contratti di lavoro dal 1913 al 1931. Confederazione Nazionale dei Sindacati Fascisti dell'Agricoltura, Rome, 1931-IX.

[The enquiry into wages in Italian agriculture recently published by the National Confederation of the Fascist Syndicates of Agriculture is supplementary to that of

1930 on the conditions of living of the agricultural workers in Italy. The figures shown relate to the daily wage paid in 1913-14 and from 1919 to 1931 to day farm labourers for ordinary farm work. The wages are shown for each province. An index has also been calculated taking the wage for 1913-14 as 100. Every table is accompanied by a diagram and by some notes illustrating the principal lines of the last labour agreement. The wages are taken from the labour agreements. For the years immediately preceding and immediately following the war it has not always been possible to base these on the agreements, partly because these were not all in existence and partly because the multiplicity of the workers' organisations gave rise to the establishment of several types of contracts. In consequence, it has been necessary to establish the figures by examining farm accounts, and by consulting the agricultural organisations and various publications.

A special chapter is devoted to the different types of wages: the wage paid over a fixed period, the payment per hour, cash wages, wages in kind, piece or job work, the progressive wage, sliding scale, individual and collective job contracts. The wage is next considered under other aspects, according to the character of the work, the hours of work in different seasons, the age of the workers, etc. In view of the close relation between feeding and the question of wages some notes on the dietary of the farm worker are added. A chapter on the corporative wage forms the conclusion].

L'organizzazione sindacale agricola del Fascismo. Confederazione Nazionale dei Sindacati Fascisti dell'Agricoltura. Roma, 1932-X.

[In this publication an account is given of the organisation of the Italian agricultural classes, as effected by Fascism, from the beginning of Fascist syndicalism up to 1932, and a comparison is made between the post-war Italian organisations previous to Fascism and the European organisations of agricultural workers based on the class principle. The volume also contains some chapters on the Italian agricultural population, and on the different occupational types of Italian agricultural labourers, share tenants, etc., and on the organised labourers. It further treats of the degree of development attained by the different National Federations of unions of persons employed on farms, tenants who are direct cultivators, share tenants on the basis of half the produce or otherwise, wage earners and day labourers, skilled farm workers, shepherds and breeders who manage their stock rearing. The proportion of the different classes is separately examined for each of the Italian provinces].

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[This small volume, published on the occasion of the XVth International Congress of Agriculture at Prague under the auspices of the Czechoslovakian public authorities, contains, in a series of articles written by Czechoslovakian specialists, on the subject of agricultural education, precise information on the present position of agricultural instruction, according to the different types of schools and institutions which deal with public instruction in the rural areas in Czechoslovakia].

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# AGRICULTURAL STATISTICS





# MONTHLY CROP REPORT

## AND AGRICULTURAL STATISTICS

*At this period of the year many Governments suspend their monthly crop condition reports until next spring when they again commence.*

*The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.*

### CEREALS

The estimates of crop results for the year received by the Institute up to the middle of January make changes of only secondary importance in the totals of world production of the various cereals indicated in the following table from which are excluded the figures for the U. S. S. R. and China in the absence of official data. For wheat the estimate

#### *World production of cereals.*

	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat . . . . .	2,183	2,238	2,071	2,362	2,174	2,039	2,006
Rye . . . . .	459	558	561	544	500	460	571
Barley . . . . .	589	902	723	720	607	574	596
Oats . . . . .	1,049	1,129	1,178	1,243	1,108	1,141	1,191
(million bushels)							
Wheat . . . . .	3,638	3,729	3,450	3,936	3,623	3,395	3,344
Rye . . . . .	819	996	1,002	972	894	820	1,020
Barley . . . . .	1,226	1,442	1,506	1,499	1,266	1,196	1,244
Oats . . . . .	3,279	3,527	3,680	3,886	3,464	3,567	3,721

of world production consequently remains almost the same as that calculated last month and it does not seem, moreover, that it will be substantially modified in the future when the final figures are issued. In fact, for the countries of the northern hemisphere the December estimates, apart from exceptional cases, differ very little from the final figures and for the countries of the southern hemisphere for which only provisional data are possessed, no large changes are anticipated. The first forecast for Argentina in fact, is generally judged to be fairly exact although it is considered by some authorities to be

too conservative. This supposition, however, seems to be based on the remembrance of the large under-estimation of the crops of 1929 and 1930 rather than on actual facts. It should, in any case, be recollected that the official figure of production in 1931 seems, on the basis of the figures of movement of trade and stocks, to have been fixed too high rather than too low. As regards Australia, the November forecast has been confirmed by two telegrams from the Government in December and January. With respect to the Union of South Africa the Government has telegraphed to the Institute that the wheat crop has been particularly abundant and is provisionally estimated at nearly 8.5 millions centals (14.2 million bushels) constituting a record for the country. As the yearly consumption of the Union fluctuates about this figure, it is expected that demand in 1932 by this country will be considerably reduced ; at all events the Union normally only imports a yearly quantity of 2.5 million centals (4.9 million bushels).

As far as concerns Europe and its wheat requirements it is at the present moment interesting to examine the movement of its imports during the first four months of the season for which official figures are available. According to the forecasts published in the Institute's Crop Report for October, European import requirements are placed at 390 million centals (640 million bushels) distributed among the various countries in the proportion indicated in the following table. This calculation of the probable requirements of each country can only be considered as a forecast and as such may be subject to even large modifications in view of the present disturbed economic situation. Opposite the probable requirements of each country for the season have been inserted the net imports in the first four months August 1- November 30.

*Estimate of European wheat requirements for 1931-32 and net imports  
in the first four months of the season.*

COUNTRIES	Season 1 August-31 July		First 4 months 1 August-30 Nov.		Season 1 August-31 July		First 4 months 1 August-30 Nov.	
	Estimated require- ments for 1931-32	Net imports 1930-31	Net imports 1931-32	Net imports 1930-31	Estimated require- ments for 1931-32	Net imports 1930-31	Net imports 1931-32	Net imports 1930-31
	million centals				million bushels			
Germany . . . . .	13	19	0.4	7.7	21	31	1	13
Austria . . . . .	11	9	2.6	2.2	18	15	5	4
Belgium . . . . .	30	23	10.0	9.7	48	47	17	16
Denmark . . . . .	11	7	5.1	2.0	18	11	8	3
Spain and Portugal . . . . .	5	0	0.4	0.2	7	0	1	0
Estonia, Finland, Latvia and Lithuania . . . . .	0	4	1.8	2.4	14	6	3	4
France . . . . .	33	37	10.0	9.3	55	61	26	15
United Kingdom . . . . .	160	146	67.7	52.5	264	244	113	87
Greece . . . . .	17	15	5.0	4.6	28	24	8	8
Italy . . . . .	30	40	2.2	16.5	50	81	4	28
Netherlands . . . . .	22	21	5.5	8.4	37	35	9	14
Sweden and Norway . . . . .	14	8	3.0	3.7	23	13	5	6
Switzerland . . . . .	13	11	5.1	4.4	22	18	8	7
Czechoslovakia . . . . .	20	10	5.7	5.5	32	17	10	9
Malta etc. . . . .	2	2	0.8	0.8	3	3	1	1
<b>Total Europe. . .</b>	<b>390</b>	<b>366</b>	<b>131.3</b>	<b>129.9</b>	<b>640</b>	<b>606</b>	<b>219</b>	<b>215</b>

Some comments may be made on this table. In the first place it should be noted that over one half of the imports in the first four months were absorbed by the United Kingdom whereas on the basis of estimated requirements the proportion should not have greatly exceeded 40 %. A considerable part of the import has not, however, been consumed ; in fact, wheat stocks at the English ports increased from August 1 to November 1 by 11 million centals (18 million bushels) so that the quantities released for con-

sumption during these four months were reduced to nearly 57 million centals (95 million bushels) a figure which is slightly larger, pro rata, than that of estimated requirements. The demand of the United Kingdom for the whole of the season may consequently reach the level anticipated. France had already imported in the first four months the quantity estimated to suffice for nearly half of the season, although for milling the proportion of foreign wheat is limited to 3 %. It is true that part of the import is North African wheat which, according to the milling law is considered to be a home product. The French demand for the whole of the season may even exceed the figure estimated. Italy has greatly reduced its imports so that in the period considered the quantity on which duty has been paid only reached 2 million centals (4 million bushels); the strict application of the milling quota for home-grown wheat (95 % for soft wheat and 75 % for hard wheat) has restricted Italian demand to quite moderate quantities. This demand will not fail, however, in the coming months to increase as supplies of the home-grown product become smaller. The home crop of 1931 is sufficient to cover needs for ten months' consumption; the remainder, amounting to about 30 million centals (50 million bushels) will have to be imported. The Government has recently changed the milling quota for imported hard wheat to 50 %; a change also seems to be imminent for soft wheat due to the tendency to rising quotations on the market in the last months (1).

Germany, like Italy, is one of the countries which have nearly reduced to nothing their consumption of foreign wheat. In the first four months the imports nearly balance the exports leaving a net quantity of only 400,000 centals (700,000 bushels). Germany will undoubtedly, however, need to obtain supplies on the world market because although the home crop of wheat was 10 million centals (16 million bushels) larger than in the previous year, the rye crop was 22 million centals (40 million bushels) smaller with the result that the total supply of wheat and rye is 12 million centals (24 million bushels) smaller than that of last year when it was found necessary to purchase 19 million centals (31 million bushels) of wheat on the world market. Even admitting that this country will be obliged by its financial difficulties to restrict its consumption and admitting also that part of its requirements may be covered by rye of Russian origin (which seems to be improbable as Russian rye is quoted higher than wheat (2)) it is improbable that it can dispense with imports until the new crop. Under these conditions there is reason to believe that the estimate of 13 million centals (21 million bushels) of wheat for the whole of the present season corresponds to the requirements of this country. Belgium imported during the four months 10 million centals (17 million bushels) or nearly the same quantity as in the previous year. In 1930-1931 the total import for the season was nearly 28 million centals (47 million bushels); the same quantity may be adopted for the present season.

For the Netherlands the quantity imported from August to November does not reach the figure forecast in proportion to the total for the whole season. It is also smaller than the quantity imported in the same period of 1930. The decline of Dutch purchases is also due to the application of a compulsory milling quota for home-grown wheat and to the adoption of measures to raise the price of the home product. Even if it is feasible to expect a slight increase in demand during the coming months, it is, however, doubtful whether the quantities imported can completely reach the level forecast for the whole season. For the Baltic and Scandinavian countries, a considerable increase in

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(1) While this Report was in the press it was officially communicated that the milling quota for foreign wheat had been raised to 30 % for soft wheat and 80 % for hard wheat, dating from 1 February 1932.

(2) Copenhagen market, 11 January in kronen per quintal, Russian rye 12.50, wheat 11.

demand during the current season has been forecast, the principal reason for this being the poor rye crop. For these countries the August-November imports remained greatly below not only the quantities forecast but also last year's imports. Their demand for wheat should not fail to increase during the next few months, especially as rye is dearer and can only be obtained from the U. S. S. R. where supplies for export do not appear to be abundant. For Austria, Switzerland and Czechoslovakia an increase in requirements has been forecast — slight for the first two countries and much larger for the third — according to the results of their respective wheat and rye crops. Imports in the period August-November bear out this forecast as they greatly exceed those of the corresponding period of 1930 and are nearly confined within the limits anticipated.

For Denmark and Greece the August-November imports were also considerably larger than those of 1930, indicating a growth in demand in accordance to the forecasts.

Summing up the European supply situation as it results from the import figures in the first third of the season, it seems possible to state *a*) that, if certain countries have imported quantities in excess of their current needs and have accumulated considerable stocks, there are others, including some very large consumers, that have depended almost entirely on their own resources and will be obliged to come on to the world market much more in a very short time ; *b*) that, making the balance of quantities imported in deficit and in excess, an almost complete compensation is reached so that imports in the first four months may be considered as representative *pro rata* of the total demand during the season ; *c*) that the forecast of a European demand of 390 million centals (640 million bushels) made last October seems to be confirmed by the course of imports in the next four months of the season.

Concerning North America the revised estimates of Canadian production in 1930 and 1931 have just been published. The figure of production in 1931 has been increased by about 4 million centals (6 million bushels) compared with the November estimate. The 1930 crop which was considered (in the Institute's Crop Report of November 1931) to be underestimated in the official statistics by about 15 million centals (26 million bushels) is increased by the revision by 14 million centals (23 million bushels). The final figures of production in 1930 for Canada and the United States now permit a fairly exact calculation of the home consumption of wheat in these two countries during the season 1930-31 which has just ended ; it works out at 85 million centals (141 million bushels) for Canada and 433 million centals (722 million bushels) for the United States or a total of 518 (863). This figure corresponds to the estimate made in the study on world supplies and requirements of wheat published in the Crop Report of November 1930 in which the following opinion was expressed : " Seeing that in 1929-30 the quantity consumed amounted to 449 million centals (747 million bushels) — 380 (633) for the United States and 69 (114) for Canada — we may bring the estimate for 1930-31 to 518 million (863 million), that is 430 (716) for the United States and 88 (147) for Canada ».

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As regards the situation of winter crops of which sowings have just been completed, it is not easy to form an exact idea of the area cultivated, the information that has so far reached the Institute being scanty and incomplete. In the European importing countries, in which prices have, as a consequence of protective measures taken by the Governments concerned, maintained a level much higher than that on the world market, it is to be expected that sowings will be at least equivalent to those of last year and in some even much greater. Amongst the latter may be mentioned France, Germany, Great Britain and Northern Ireland and, to a less extent, Italy. On the other hand there

will be some reduction in the exporting countries under the pressure of very low prices though such reduction does not appear sufficiently large to compensate entirely, for the extension in the first group, so that the forecasts seem to lean toward an increase in sowings. In autumn 1930 there were sown in Europe, excluding the U. S. S. R., about 73 million acres of wheat and in the following spring about 2 million; for this autumn a figure slightly over 74 million acres may be looked upon as very probable.

*Area sown with winter cereals.*

COUNTRIES	WHEAT			RYE			BARLEY			OATS		
	1931/32	% 1931/32		1931/32	% 1931/32		1931/32	% 1931/32		1931/32	% 1931/32	
		1930-	1925-		1930-	1925-		1930-	1925-		1930-	1925-
		1931	to 1929-1930		1931	to 1929-1930		1931	to 1929-1930		1931	to 1929-1930
		= 100	= 100		= 100	= 100		= 100	= 100		= 100	= 100
(thousand acres)												
Germany . . .	4,880	104.9	128.3	11,112	104.7	97.3	583	103.9	131.4	—	—	—
Bulgaria . . .	2,884	98.0	106.4	553	99.0	115.1	489	101.0	107.4	—	—	—
Finland . . .	30	92.3	112.3	544	98.2	98.7	—	—	—	—	—	—
Lithuania . . .	370	90.3	142.6	1,229	98.4	106.1	—	—	—	—	—	—
Poland . . .	—	96.7	—	—	100.4	—	—	99.1	—	—	—	—
Rumania . . .	4,087	90.5	83.8	603	86.8	80.2	220	92.0	76.9	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Canada . . .	518	92.5	52.7	539	90.1	73.7	—	—	—	—	—	—
United States	38,682	89.6	89.6 (2)	3,712	93.0 (3)	96.8	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
British India:	—	—	—	—	—	—	—	—	—	—	—	—
Punjab . . .	10,758	100.5	103.3	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Algeria . . .	2,471	90.8	80.5	—	—	—	24,46	95.7	76.9	482	97.5	88.9
Tunis . . .	2,100	110.4	118.1	—	—	—	1,236	113.6	100.1	99	100.0	90.6

(1) Percentage of 1929/30. — (2) Acreage sown for grain allowance being made for average diversion to other uses. — (3) Percentage of the mean for 1926/27 to 1929/30.

Autumn sowings in the U. S. S. R. almost entirely composed of wheat and rye, have been made with difficulty and the area sown cannot have reached that planned by the Government or even that of last year, to which it is 3.2 million acres inferior.

In the United States the estimate of sowings communicated last month indicates a decrease of 4.5 million acres on that of 1930; in India the areas cultivated to wheat in the Punjab, the chief wheat producing area, are practically the same as last year; for India as a whole it would seem that there is a slight increase. In French North Africa sowings have met with difficulties owing to the drought and to the subsequent excess of moisture; they have on the other hand been carried out under good conditions in Egypt, where an increase in wheat sowings is expected. In North Africa as a whole it seems probable that there has been a slight extension of sowings.

Summing up all the information on the extent of autumn sowings it may be said that as regards wheat the probable expansion in Europe as a whole is in *grosso modo* compensated by the probable decrease in the U. S. S. R. and that the marked decrease in the United States is to a small extent balanced by the slight increase in the other, extra-European producing countries. It may be concluded that the reduction that has everywhere taken place in the area cultivated to autumn wheat is about 4 million acres.

The situation of crops at the beginning of the year was normal for the season in almost all European countries and in the U. S. S. R. and generally better than at the same date last year. The first half of January has been, however, both in Europe and in the U. S. S. R., abnormally mild so that the snow has almost disappeared from most yields, leaving the crops without protection against a brusque return of winter, which might cause considerable damage.

In the United States where crop condition at the beginning of December was not satisfactory the rains in the latter half of the month have been very beneficial and the situation at the beginning of the year was much improved. In the first half of January the weather continued to be favourable, falls of snow having occurred in the north and centre and rain in the south. Toward 20 January there were, however, complaints that the snow cover was in places inadequate. In India the crops were generally in good condition on 1 January but were beginning to feel the need of rain; by mid-January these needs were more pressing. Normally the wheat crop in India depends on the amount of rain in January. In North Africa weather in December was not very favourable to sprouting of cereals which was hindered by excessive rain and cold in several regions of Algeria and by drought in Morocco. However in the first half of January the situation improved. In Egypt the situation is good.

G. C.

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*Germany* : The " Statistisches Reichsamt " has published estimates of the areas sown to winter cereals. The figures (see Table) are evidently provisional and should probably be modified in the spring according to weather conditions in the meantime.

According to the preliminary estimates there should be, as last year, an increase in the area sown to winter wheat and barley. It is worthy of mention that the area sown to winter rye is also larger than that of last year. The increase in the area sown to winter rye (4.7 %) is, however, much less appreciable than the decrease in area indicated at the date of the estimate of last year (7.4 %). There is reason to believe that according to the provisional estimate the area sown to winter spelt will be nearly the same as that of last year. The relatively mild weather has facilitated work for the winter cereal sowings.

The final estimates of area and production of winter spelt and meslin are as follows :

	1931	1930	Average 1926-29	% 1931 1930 = 100	% 1931 Aver. = 100
<i>Area (thousand acres)</i>					
Winter spelt . . . . .	282	293	309	96.1	91.2
Meslin . . . . .	894	886	* 895	100.8	99.9
<i>Production.</i>					
Winter spelt . (ooo cent.)	2,941	3,048	3,238	96.5	90.8
Meslin . . . (ooo cent.)	13,236	12,461	* 13,857	106.2	95.5
» . . . (ooo bush.)	22,821	21,486	* 23,893		

\* 1927-29.

*Austria* : After the somewhat cold beginning of December temperature rose during the first ten days of the month and this was followed by abundant precipitation on the

eastern slopes of the Alps. At the beginning of the second decade there were frosts which increased in intensity until 20 December when they began to diminish rapidly in intensity. At Christmas the thin snow cover melted, particularly in the Danube valley and in places on the southern Alps. Towards the end of December temperatures again fell. During the period of most intense frosts the rather thin snow cover sufficed to protect sowings. Damage is reported only in a few regions. Crop condition of winter cereals on 1 January this year was as follows: wheat 2.4 (2.5 on 1 December and 2.4 on 1 January 1931); rye 2.4 (2.5, 2.2) and barley 2.3 (2.5 2.4).

*Belgium*: Except for some days of frost and rain, the weather in December was generally fine and mild.

Threshing of cereals, manure carting and winter operations continued; the latter has been finished almost everywhere.

Winter cereals appear to be in very good condition.

*Bulgaria*: The weather in December was generally cold but, thanks to the snow that fell at the beginning of the month and continued to lie, did not damage winter cereals.

*Estonia*: The latest estimate of production of meslin in 1931 is 2,026,000 centals (3,492,000 bushels) against 1,846,000 (3,182,000) in 1930 and 1,429,000 (2,464,000) on the average for the preceding five years. Percentages: 109.7 and 141.7.

*Irish Free State*: Weather in December was mild save in the last few days when frosty conditions were experienced. Only a relatively small number of sowings remained to be carried out during the month. Early sown crops germinated regularly and braided uniformly and at the end of December looked vigorous.

*Finland*: Sowing of winter cereals has been effected under average conditions and germination has been regular.

*France*: The situation is satisfactory. A period of severe cold at the end of December cleaned the fields. Snow has been rare and in some districts oats have been slightly damaged but condition of the sowings is in general good. In the Paris region the thaw with mild, damp weather came too quickly to suit the farmers.

Autumn field work was finished in good time and in generally satisfactory conditions; winter work of preparing the soil for spring sowings has made active progress.

*Great Britain and Northern Ireland*: A somewhat larger area of wheat had been sown by the end of December in England and Wales than at the corresponding date of the previous year; in Scotland sowing was practically completed by the end of the month. There had been no increase in barley sowings in England and Wales, while for some parts of the country slight decreases were reported in the area under oats. Mild open weather prevailed and good progress was made by crops.

*Hungary*: The four weeks from November 14, to December 12, were characterised by temperatures generally below the normal for the period and about average rainfall over most of the country. The snow cover was thin. On December 5 the whole of

## Cereals.

COUNTRIES	(†) AREA					(†) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	
	—	—	—	1930	Aver.	—	—	—	—	—	—	1930	Aver.
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	1931 = 100
	1,000 acres					1,000 centals			1,000 bushels				
WHEAT													
Germany . . . . .	5,355	4,402	4,067	121.7	131.6	98,329	83,531	71,850	155,545	130,216	119,763	111.7	120.9
Austria . . . . .	507	508	504	99.8	100.6	5,631	7,205	6,786	9,884	12,008	11,309	78.2	88.0
Belgium . . . . .	396	411	375	96.3	105.5	9,153	7,942	8,879	15,255	13,236	14,799	115.3	103.1
Bulgaria . . . . .	2,964	3,006	2,662	98.6	111.3	36,718	34,391	24,255	61,195	57,317	40,474	106.8	151.2
Denmark . . . . .	259	249	247	104.2	105.0	5,953	6,130	6,229	9,921	10,216	10,382	97.1	95.6
Spain . . . . .	11,245	11,134	10,704	101.0	105.1	80,657	88,021	87,700	134,420	146,699	146,179	91.6	92.0
Estonia . . . . .	90	90	66	109.6	150.6	1,043	981	605	1,738	1,635	1,009	106.3	172.2
Finland . . . . .	47	51	40	92.7	116.7	606	726	562	1,161	1,210	936	95.0	124.0
France . . . . .	12,494	13,202	13,240	94.7	94.4	161,781	138,673	174,815	260,030	231,118	201,353	116.7	92.5
Engl. and Wales . . . . .	1,197	1,346	1,491	88.9	80.3	21,526	23,972	29,677	35,877	39,954	49,460	89.8	72.5
Scotland . . . . .	50	54	56	92.8	90.0	1,075	1,277	1,322	1,792	2,128	2,203	84.2	81.4
*Northern Ireland . . . . .	3	5	5	67.1	62.7	...	102	107	...	171	178	...	...
Greece . . . . .	...	1,312	1,251	...	...	7,337	7,229	7,334	12,228	12,048	12,223	101.5	100.0
Hungary . . . . .	4,004	4,187	3,821	95.6	104.8	41,513	50,604	47,726	69,186	84,338	79,512	82.0	87.0
Italy . . . . .	12,075	11,917	12,156	101.3	99.3	148,763	126,044	137,524	247,983	210,060	220,203	118.0	108.2
Latvia . . . . .	215	179	139	120.2	154.8	2,033	2,439	1,380	3,388	4,066	2,209	83.3	147.3
Lithuania . . . . .	478	526	352	91.0	136.1	5,004	6,796	3,647	8,940	11,327	6,079	73.6	137.2
Luxemburg . . . . .	23	25	30	89.2	74.8	243	265	344	406	442	573	91.7	70.8
Malta . . . . .	10	9	9	104.8	105.8	166	182	175	277	303	292	91.6	94.9
Norway . . . . .	29	30	25	94.2	113.3	451	432	388	752	720	646	104.4	116.8
Netherlands . . . . .	191	142	135	134.4	141.1	3,761	3,634	3,623	6,298	6,056	6,037	103.5	103.8
Poland . . . . .	4,496	4,066	3,304	110.6	136.1	43,502	49,394	36,305	80,885	82,321	60,568	98.2	136.6
Portugal . . . . .	1,161	1,120	1,071	103.7	103.4	7,226	8,290	6,102	12,012	13,817	10,171	87.2	118.4
Rumania . . . . .	8,566	7,551	7,746	113.4	110.6	76,721	78,464	63,319	127,866	130,770	105,530	97.8	121.2
Sweden . . . . .	684	646	488	105.9	140.2	11,773	12,882	9,381	19,621	21,469	15,633	91.4	125.5
Switzerland (1) . . . . .	179	180	171	99.6	104.6	3,565	3,461	3,357	5,941	5,769	5,535	103.0	106.2
Czechoslovakia . . . . .	1,973	1,975	1,869	100.2	105.0	22,901	30,364	28,686	34,317	50,606	47,809	75.7	80.1
Yugoslavia . . . . .	5,390	5,365	4,703	100.5	114.5	59,274	48,197	48,593	98,789	80,326	80,986	123.0	122.0
Total Europe . . . . .	(§) 75,404	73,683	70,727	102.2	106.6	566,885	521,536	510,612	1,428,115	1,369,184	1,350,995	104.3	105.2
*U. S. S. R. . . . .	92,369	83,795	71,278	110.2	120.6	...	650,366	477,453	...	1,083,921	795,739	...	...
Canada . . . . .	26,115	24,898	23,104	104.0	113.0	182,186	252,403	258,428	304,144	420,672	439,704	72.9	70.6
United States . . . . .	54,940	61,138	57,632	89.9	95.2	555,363	514,896	493,086	892,271	858,106	822,791	104.0	108.4
Mexico . . . . .	1,424	1,216	1,291	117.1	113.0	9,467	6,668	6,456	15,778	11,446	10,700	137.8	146.6
Total North Amer. . . . .	82,488	87,252	82,027	91.5	100.5	727,316	774,167	758,570	1,312,193	1,290,728	1,262,495	95.9	95.9
China: Manchuria . . . . .	3,920	3,413	2,731	114.8	143.5	35,037	30,515	27,101	58,394	50,867	46,167	114.8	121.3
Korea . . . . .	...	848	890	...	...	5,370	5,391	5,695	8,951	8,965	9,342	99.0	96.8
India . . . . .	32,181	31,654	31,475	101.7	102.2	208,365	234,506	191,654	347,275	330,843	310,424	88.9	108.7
Japan . . . . .	1,231	1,198	1,174	102.7	104.9	18,536	17,723	17,817	30,892	29,538	29,695	104.6	104.6
Syria and Lebanon . . . . .	1,168	1,166	1,147	100.1	101.8	8,858	11,133	7,435	13,929	18,555	12,392	75.1	112.4
Total Asia . . . . .	(§) 39,348	38,279	37,417	102.8	105.2	272,666	299,268	249,612	459,441	498,778	416,620	92.1	110.4
Algeria . . . . .	3,535	3,990	3,654	88.8	96.8	17,747	10,350	17,790	20,578	32,249	20,649	91.7	90.8
*Cyrenaica . . . . .	18	38	33	46.2	53.2	...	93	119	...	155	198	...	...
Egypt . . . . .	1,640	1,522	1,554	108.4	106.1	27,643	23,852	24,030	46,071	39,753	40,049	115.9	115.0
Eritrea . . . . .	22	7	27	300.0	82.4	110	26	61	184	44	101	416.7	181.8
Kenya (2) . . . . .	59	71	57	83.7	104.3	200	389	358	483	648	597	71.5	80.8
French Morocco . . . . .	2,732	2,957	2,632	92.4	103.8	20,825	12,782	16,553	34,708	21,302	27,588	162.9	125.8
Tripolitania . . . . .	17	12	34	140.0	50.7	46	11	64	77	18	107	420.0	71.9
Tunis . . . . .	1,927	1,923	1,719	100.3	112.1	8,378	6,239	7,068	13,962	10,398	11,780	134.3	118.5
Total Africa . . . . .	9,941	10,472	9,677	94.8	102.8	75,039	62,649	65,924	125,063	104,412	109,871	119.7	113.3
Argentina (3) . . . . .	17,236	21,283	20,484	81.3	84.4	131,175	141,578	145,819	218,621	235,058	243,026	92.7	90.0
*Chile . . . . .	1,426	1,610	1,602	88.6	89.0	...	12,714	17,255	...	21,100	23,768	...	...
*Uruguay . . . . .	1,153	864	1,056	133.4	100.2	...	4,381	7,385	...	7,218	12,224	...	...
Un. of South Africa . . . . .	...	1,137	878	...	...	8,538	6,108	4,927	14,230	10,180	8,212	139.8	173.3
Australia . . . . .	13,990	13,212	12,797	76.8	109.3	102,000	127,969	81,605	170,000	213,266	136,006	70.7	125.0
*New Zealand . . . . .	276	243	227	113.6	121.8	...	3,900	4,582	...	6,500	7,637	...	...
Grand Totals . . . . .	(§) 239,603	250,318	234,037	95.7	102.4	2,176,619	2,333,255	2,117,069	3,627,661	3,322,656	3,523,388	97.5	102.8
RYE													
Germany . . . . .	10,789	11,642	11,614	92.7	92.9	147,269	169,297	167,462	262,982	302,317	299,040	87.0	87.9
Austria . . . . .	904	927	946	97.5	95.5	10,260	11,556	11,257	18,322	20,636	20,102	88.8	91.1
Belgium . . . . .	553	574	563	96.3	97.3	11,835	10,433	12,208	21,135	18,830	21,797	113.4	97.0
Bulgaria . . . . .	597	657	481	90.8	124.3	6,760	7,067	4,104	12,072	12,620	7,329	95.7	164.7
Denmark . . . . .	332	360	448	90.0	74.1	4,850	5,814	6,349	8,661	10,026	11,397	86.4	76.4
Spain . . . . .	1,516	1,551	1,717	97.8	88.3	10,367	12,064	13,554	18,512	21,544	23,847	85.9	77.6
Estonia . . . . .	356	367	354	97.0	100.4	3,259	4,975	3,325	5,820	8,885	5,937	65.5	93.0
Finland . . . . .	554	556	553	99.3	100.1	6,604	7,898	6,712	11,792	14,104	11,985	83.6	90.4
France . . . . .	1,775	1,878	1,968	91.5	90.9	17,368	16,383	19,963	31,013	29,255	35,648	106.0	87.0
*Engl. and Wales . . . . .	33	32	28	103.6	115.4	...	470	489	...	840	785	...	...



COUNTRIES	(t) AREA					(t) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	Aver. = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	Aver. = 100
	1,000 acres					1,000 centals			1,000 bushels				
Greece . . . . .	...	163	121	...	...	1,016	1,045	868	1,815	1,866	1,540	97.3	117.1
Hungary . . . . .	1,484	1,611	1,649	92.1	90.0	12,082	15,907	16,836	21,575	28,406	30,064	76.0	71.8
Italy . . . . .	288	302	307	95.4	93.7	3,469	3,431	3,649	6,195	6,127	6,516	101.1	95.1
Latvia . . . . .	571	600	627	86.6	91.0	3,098	8,051	5,228	5,531	14,377	9,335	38.5	59.3
Lithuania . . . . .	1,257	1,197	1,192	105.0	105.4	9,118	14,009	11,412	16,282	25,177	20,379	64.7	79.9
Luxemburg . . . . .	16	22	17	73.7	96.3	171	269	206	306	480	367	63.8	83.3
Norway . . . . .	15	19	21	79.9	72.5	301	311	325	538	556	580	96.8	92.7
Netherlands . . . . .	444	475	489	93.3	90.8	7,350	8,340	8,866	13,125	14,892	15,832	88.1	82.9
Poland . . . . .	14,262	14,567	14,016	97.9	101.8	124,782	152,399	136,378	222,826	273,928	243,524	81.3	91.5
*Portugal . . . . .	593	406	488	146.2	121.4	...	2,744	2,464	...	4,901	4,401	...	...
Rumania . . . . .	1,006	968	720	104.0	139.9	8,919	10,241	5,971	15,747	18,288	10,662	80.1	147.7
Sweden . . . . .	510	595	741	85.6	98.8	6,884	10,083	10,981	12,204	18,005	19,609	67.8	62.2
Switzerland . . . . .	46	49	49	92.5	93.5	800	831	912	1,429	1,484	1,629	96.3	87.7
Czechoslovakia . . . . .	2,193	2,599	2,535	95.9	98.4	23,279	39,409	37,015	50,498	70,374	66,009	71.8	76.4
Yugoslavia . . . . .	632	626	531	99.6	117.4	4,204	4,382	4,148	7,614	7,825	7,407	71.3	102.8
Total Europe . . . . .	(\$ 40,531	42,274	41,619	95.7	97.4	428,965	515,055	487,527	765,991	919,802	870,581	83.3	88.0
*U. S. S. R. . . . .	70,086	72,233	66,620	97.0	105.2	...	...	489,088	...	...	873,285	...	...
Canada . . . . .	778	1,448	794	53.7	97.9	2,980	12,380	7,245	5,322	22,018	12,987	24.2	41.1
United States . . . . .	3,143	3,543	3,546	88.7	88.6	18,338	25,412	25,053	32,740	45,379	44,737	72.2	73.2
Total North Amer. . . . .	3,921	4,991	4,340	78.6	90.1	21,318	37,792	32,298	38,063	67,397	57,674	56.5	66.0
Argentina (s) . . . . .	1,378	1,322	901	104.3	153.0	5,071	2,646	3,852	9,055	4,724	5,980	191.7	151.3
*Chili . . . . .	7	8	7	88.7	95.2	...	67	66	...	120	118	...	...
Grand Totals . . . . .	(\$ 45,853	49,687	46,890	94.2	97.8	455,344	555,473	523,177	813,117	991,933	934,244	83.0	87.1

## BARLEY

Germany . . . . .	4,001	3,753	3,002	106.6	108.4	60,540	63,058	63,172	138,628	131,373	131,611	105.5	105.3
Austria . . . . .	422	430	371	98.1	113.8	5,119	5,803	5,237	10,665	12,278	10,911	86.0	97.7
Belgium . . . . .	70	84	77	83.2	91.3	1,630	1,890	1,804	3,396	3,825	3,947	88.8	86.1
Bulgaria . . . . .	607	692	562	87.7	108.0	7,049	9,537	5,858	16,560	19,869	12,204	83.3	135.7
Denmark . . . . .	880	928	826	95.8	107.6	21,385	23,170	19,040	41,553	48,272	41,542	92.3	107.2
Spain . . . . .	4,614	4,543	4,450	102.2	104.2	43,548	49,883	44,786	90,727	103,026	93,305	87.3	97.2
Estonia . . . . .	279	278	285	100.9	98.0	2,810	2,820	2,454	5,918	5,903	5,112	100.4	115.8
*Irish Free State . . . . .	115	116	131	99.0	87.9	...	2,648	3,001	...	5,517	6,253	...	...
Finland . . . . .	276	272	273	101.4	100.8	3,086	2,987	3,114	6,430	6,223	6,487	103.3	90.1
France . . . . .	1,900	1,836	1,776	106.8	110.3	26,307	21,761	24,356	54,807	49,336	50,742	120.9	108.0
Engl. and Wales . . . . .	1,029	1,020	1,164	100.9	88.4	17,293	16,503	21,524	36,027	34,382	44,843	104.8	80.3
Scotland . . . . .	88	107	121	82.5	72.6	1,058	2,128	2,433	3,463	4,483	5,068	77.9	68.1
*N. Ireland . . . . .	1	2	2	68.4	77.9	...	48	40	...	99	84	...	...
Greece . . . . .	...	529	453	...	...	4,403	3,923	3,249	9,172	8,178	6,788	112.2	135.5
Hungary . . . . .	1,164	1,131	1,054	102.9	110.4	10,249	13,250	13,118	21,352	27,605	27,380	77.3	78.1
Italy . . . . .	530	583	577	90.8	91.8	5,289	5,377	5,416	11,020	11,202	11,285	98.4	97.7
Latvia . . . . .	463	437	436	103.6	104.0	4,228	4,130	3,420	8,809	8,605	7,126	102.4	123.6
Lithuania . . . . .	474	529	494	89.6	95.9	5,205	5,224	4,831	10,845	10,884	10,065	99.6	107.7
Luxemburg . . . . .	9	7	8	116.1	101.9	107	99	112	224	206	233	108.7	95.9
Malta (s) . . . . .	7	7	6	101.4	106.0	137	142	138	285	295	288	96.8	99.0
Norway . . . . .	138	134	143	102.8	97.1	2,257	2,362	2,368	4,708	4,922	4,929	95.6	95.4
Netherlands . . . . .	70	76	71	92.8	99.3	1,764	1,939	1,916	3,874	4,040	3,992	91.0	92.0
Poland . . . . .	3,128	3,048	2,841	102.6	110.1	32,408	32,274	30,767	67,518	67,638	64,099	100.4	105.3
*Portugal . . . . .	148	171	181	86.9	81.8	...	1,136	870	...	2,367	1,813	...	...
Rumania . . . . .	4,742	4,881	4,389	97.2	108.8	33,731	52,279	30,283	70,274	108,916	75,487	64.5	93.1
Sweden . . . . .	313	326	348	96.0	90.0	4,838	5,290	5,719	10,059	11,021	11,916	91.3	84.4
Switzerland . . . . .	18	16	16	104.2	110.1	205	238	287	615	498	556	124.1	110.7
Czechoslovakia . . . . .	1,760	1,673	1,766	105.1	99.6	21,813	26,848	28,597	45,448	55,934	59,579	81.2	76.3
Yugoslavia . . . . .	1,105	1,133	976	97.6	113.3	8,640	9,915	8,342	18,000	18,574	17,379	99.9	108.6
Total Europe . . . . .	(\$ 23,794	23,451	27,152	109.9	105.7	332,769	361,575	339,259	693,360	753,921	706,894	91.9	96.1
*U. S. S. R. . . . .	17,070	18,417	17,724	92.7	96.3	...	...	124,687	...	...	299,770	...	...
Canada . . . . .	3,708	5,559	4,297	67.8	87.7	32,349	64,877	50,188	67,382	135,160	104,550	49.9	64.4
United States . . . . .	11,471	12,602	10,313	90.6	111.2	95,503	146,208	125,026	198,985	304,601	290,476	65.3	76.4
Total North Amer. . . . .	15,239	18,221	14,610	83.6	104.3	127,846	211,085	175,209	266,347	439,761	365,026	60.6	73.0
Korea . . . . .	...	2,382	2,209	...	...	19,621	19,127	17,668	40,877	39,849	36,805	102.6	111.1
Japan . . . . .	2,105	2,110	2,336	99.8	90.1	36,730	34,786	40,696	76,522	72,472	84,785	105.6	90.3
Syria and Lebanon . . . . .	941	681	706	113.3	133.4	6,812	10,852	6,746	14,193	22,621	14,055	62.7	101.0
Total Asia . . . . .	(\$ 6,498	6,323	5,251	102.0	103.4	63,163	64,771	65,108	131,692	134,942	135,645	97.6	97.0

COUNTRIES	(†) AREA					(†) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32	1931	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	1931
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/31	Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/31	Aver.
	1,000 acres					1,000 centals			1,000 bushels				
Algeria . . . . .	3,190	3,650	3,445	87.6	92.8	14,881	18,327	16,661	31,003	38,183	34,712	81.2	89.3
*Cyrenaica . . . . .	82	127	133	64.5	61.3	...	276	772	...	574	1,609	...	...
Egypt . . . . .	306	345	368	88.7	83.0	4,653	5,043	5,440	9,093	10,506	11,334	92.3	85.5
Eritrea . . . . .	62	47	58	131.6	105.9	320	207	160	666	432	346	151.3	102.3
French Morocco . . . . .	3,156	3,207	3,025	98.4	104.2	24,643	17,995	21,933	51,341	37,491	45,695	136.9	112.4
Tripolitania . . . . .	99	124	274	80.0	36.0	205	165	609	551	344	1,268	160.0	43.5
Tunis . . . . .	1,087	1,202	1,243	90.4	87.5	3,903	2,640	4,195	8,268	5,512	8,741	150.0	94.6
Total Africa . . . . .	7,909	8,573	8,416	92.0	93.9	18,730	14,383	19,000	107,522	92,168	102,096	109.6	99.1
Argentina (3) . . . . .	1,439	1,460	1,171	101.2	122.8	9,039	6,834	7,061	18,832	14,238	16,587	132.3	113.5
*Chili . . . . .	144	166	173	86.9	83.4	...	1,800	2,681	...	3,876	5,585	...	...
*Uruguay . . . . .	10	15	8	66.1	123.3	...	132	64	...	276	133	...	...
*New Zealand . . . . .	24	25	23	95.0	102.6	...	397	458	...	828	953	...	...
Grand Totals . . . . .	(§) 58,719	61,992	56,600	94.7	103.7	581,487	688,948	636,541	1,211,453	1,435,530	1,336,138	84.4	91.3
OATS													
Germany . . . . .	8,309	8,499	8,640	97.8	96.2	136,795	124,702	143,393	427,482	389,690	440,664	109.7	95.5
Austria . . . . .	720	772	767	93.3	95.2	7,346	8,834	9,591	22,956	27,606	29,972	83.2	76.6
Belgium . . . . .	723	674	678	107.9	107.3	12,036	12,231	15,318	40,581	38,223	47,869	106.2	84.8
Bulgaria . . . . .	205	345	338	85.6	87.4	2,764	2,437	2,332	8,605	7,616	7,287	113.0	118.1
Denmark . . . . .	938	958	1,028	97.9	91.2	20,721	21,092	21,201	64,761	68,725	66,254	91.2	97.7
Spain . . . . .	1,983	1,940	1,873	102.3	106.0	13,335	15,999	12,013	41,670	49,905	40,854	83.3	103.3
Estonia . . . . .	367	368	357	99.6	102.7	3,615	3,478	2,670	11,296	10,870	8,343	103.9	135.4
*Irish Free State . . . . .	628	644	656	97.5	95.8	...	14,160	14,419	...	44,250	45,090	...	...
Finland . . . . .	1,149	1,137	1,098	101.1	104.7	14,684	13,207	12,775	45,886	41,458	39,922	110.7	114.0
France . . . . .	8,638	8,557	8,593	100.9	100.5	110,152	96,880	111,902	344,222	302,749	340,630	113.7	98.4
Engl. and Wales . . . . .	1,652	1,778	1,820	92.9	90.8	27,776	30,036	32,202	86,800	93,863	100,632	92.5	86.3
Scotland . . . . .	835	862	906	96.9	92.1	13,933	14,498	15,882	43,540	45,290	49,630	96.1	87.7
*N. Ireland . . . . .	289	307	315	93.1	90.8	...	6,209	6,297	...	19,493	19,678	...	...
Greece . . . . .	...	359	262	...	...	2,116	1,917	1,563	6,614	5,991	4,900	110.4	135.0
Hungary . . . . .	596	608	687	98.0	86.7	4,014	5,760	8,235	12,636	17,999	25,734	70.2	49.1
Italy . . . . .	1,222	1,262	1,243	96.9	98.3	13,381	11,785	13,793	41,658	36,828	48,103	113.1	96.0
Latvia . . . . .	795	790	740	100.6	107.5	7,555	7,532	5,480	23,611	23,537	17,124	100.3	137.0
Lithuania . . . . .	900	855	823	105.3	108.7	8,081	8,599	6,846	28,005	26,871	21,394	104.4	131.2
Luxembourg . . . . .	70	70	72	100.0	97.0	880	880	971	2,749	2,750	3,035	100.0	90.6
Norway . . . . .	237	289	241	99.0	98.2	3,339	4,359	4,024	10,433	13,621	12,574	76.6	83.0
Netherlands . . . . .	369	370	377	99.0	97.1	6,067	6,545	7,332	18,960	20,454	22,913	92.7	82.7
Poland . . . . .	5,367	5,404	5,007	99.3	107.2	52,691	51,756	51,251	164,657	161,738	160,159	101.8	102.8
*Portugal . . . . .	371	420	476	86.5	77.9	...	2,489	1,740	...	7,778	5,436	...	...
Rumania . . . . .	2,154	2,636	2,806	80.2	76.8	17,858	25,497	22,518	55,804	79,679	70,368	70.0	79.3
Sweden . . . . .	1,589	1,629	1,763	97.5	90.1	21,539	25,299	26,111	67,310	79,058	81,595	85.1	82.5
Switzerland . . . . .	45	48	50	93.9	90.6	851	851	928	2,659	2,650	2,900	100.0	91.7
Czechoslovakia . . . . .	2,116	2,049	2,078	103.3	101.9	26,526	23,833	30,997	82,393	90,101	96,885	92.0	85.8
Yugoslavia . . . . .	979	1,037	936	94.4	104.6	5,837	6,283	7,548	18,242	19,634	23,586	92.9	77.3
Total Europe . . . . .	(§) 42,412	43,296	43,183	97.9	98.2	555,715	530,245	568,281	1,674,090	1,637,005	1,775,867	101.0	94.3
*U. S. S. R. . . . .	42,497	44,267	41,262	96.0	103.0	...	...	326,462	...	...	1,020,185	...	...
Canada . . . . .	12,871	13,259	12,891	97.1	100.3	111,015	143,870	133,306	348,795	449,595	416,683	77.6	83.7
United States . . . . .	39,722	39,729	42,175	100.0	94.2	355,835	408,884	414,391	1,112,432	1,277,764	1,204,962	87.0	85.6
Total North Amer. . . . .	52,593	52,988	55,066	99.3	95.6	466,850	552,754	547,697	1,460,937	1,727,359	1,711,545	84.6	85.4
Syria and Lebanon . . . . .	27	28	41	96.5	66.8	182	175	282	570	547	880	104.2	67.7
Algeria . . . . .	542	638	605	84.0	80.6	3,483	5,300	4,118	10,885	16,561	12,869	65.7	84.6
French Morocco . . . . .	73	103	71	71.6	103.9	755	754	559	2,359	2,357	1,747	100.1	135.0
Tunis . . . . .	99	124	104	70.6	94.7	1,036	661	825	3,238	2,067	2,577	156.7	125.7
Total Africa . . . . .	714	865	780	82.6	91.5	5,274	6,715	5,502	16,482	20,985	17,193	78.5	95.8
Argentina (3) . . . . .	3,470	3,387	3,387	88.1	102.5	20,944	15,873	21,278	65,449	49,004	68,499	131.9	98.4
*Chili . . . . .	156	193	193	81.0	80.0	...	1,835	2,199	...	5,109	6,870	...	...
*Uruguay . . . . .	152	179	150	85.2	101.8	...	1,101	369	...	3,440	2,716	...	...
*New Zealand . . . . .	329	322	320	102.2	102.9	...	1,381	1,485	...	4,314	4,639	...	...
Grand Totals . . . . .	(§) 99,216	101,114	102,397	98.1	96.9	1,029,615	1,105,762	1,143,942	3,217,528	3,455,500	3,571,978	93.1	90.1

(†) The two dates mentioned refer to the years in which the harvest took place in the northern and southern hemispheres respectively. —

\* Countries not included in the totals. — (3) For the few countries for which figures are still lacking the data of area in 1930 have been utilized. — (1) Including spelt and meslin. — (2) European crops only. — (3) Area sown. — (4) Barley and meslin.

the country was covered with a layer of snow 2 inches deep and more in some districts but it melted after 1 or 2 days.

(Of the autumn sowings those put in early are well developed and tufted ; later sowings have germinated well and uniformly but lack of moisture and the cold have somewhat retarded their development. Insects have caused only isolated damage.

According to a telegram of January 19, autumn sowings are developing well ; despite the lack of snow cover, the frost has caused no damage.

*Italy* : During December clear weather predominated in northern and central Italy and there were some sharp frosts ; in southern and insular Italy heavy rains fell with some snowfall in the hills and mountains. Sowings appear to be in good condition ; in some cereal producing areas restricted damage has been caused by field mice.

*Latvia* : Areas to be sown in 1932 are as follows, in percentages of those sown in 1931. winter wheat 117, spring wheat 129, rye 87, meslin 100, barley 104, oats 101. Mean temperature in December was above normal, the sky was generally overcast and precipitation was abundant, exceeding the normal by 50-100 %. Save in more elevated regions there was only a very light snow cover. According to agricultural reporters crop condition on 1st January of rye was average in 45.6 % instances, above average in 41.8 % and below average in 12.6 %. The corresponding figures for wheat were 50.3 %, 37.2 % and 12.5 %.

*Lithuania* : According to a recent communication the meslin crop of 1931 amounted to 2,524,000 centals (4,352,000 bushels) against 2,916,000 (5,028,000) in 1930 and 2,247,000 (3,874,000), the mean of the five years ending 1929. Percentages 86.5 and 112.3.

Winter sowings were effected under relatively good conditions. Owing to the unfavourable weather conditions subsequent to sowing, the winter crops sprouted rather irregularly.

*Poland* : Autumn work in the fields was considerably behind and even partially unfinished owing to the freezing of the soil. December was marked by temperatures somewhat above the monthly mean.

The snow has for the greater part not lain. Except in Poznan and Pomerania weather cannot be considered to have favoured winter cereals.

*Rumania* : In the first half of December mean temperature fell steadily and the minimum fell to — 25°C. on 4 December (at Medias). Towards the middle of the month mean temperature increased, remaining, however, below zero throughout the country. Precipitation in the form of snow was recorded in all departments.

The snow that covered sowings at the beginning of December melted in places owing to the relatively warmer weather. The crops have so far escaped injury. Wheat, rye and winter barley sown early began the winter under good conditions.

The area sown to cereals up to the end of November 1931, when frosts and snow hindered the continuation of winter sowings shows a decrease with respect to the same date in the preceding year of 546,000 acres for winter wheat, 91,600 acres for winter rye and 19,100 acres for winter barley.

The provisional and incomplete nature of the data for 1931 and the fact that preparatory cultivations ceased at the end of November while in the preceding year with favourable weather, they continued until 10 December, must be taken into account.

*Yugoslavia* : At the beginning of December the weather was fairly cold and became more intense towards the end of the month. Snowfall was not abundant. Frosts were everywhere of brief duration and did not damage the crops.

*U. S. S. R.* : The area sown to winter cereals during the autumn of 1931 is estimated at 96,867,000 acres against 100,079,000 in the autumn of 1930 and 94,702,000 on the average for the two preceding years. The area for 1931 is consequently 3.2 % smaller than that of 1930 but 2.3 % above the average of the two years 1928 and 1929. It should be noted that according to the Government programme, the area destined to winter crops in 1931 was forecast at 106,998,000 acres so that the area actually sown is about 9 % smaller than that forecast. No separate data are so far known of the areas of the different winter crops sown in the autumn of 1931. In the previous three years the acreages sown were as follows :

	Autumn —	Winter wheat —	Winter rye —	Winter barley —
	(thousand acres)			
1930 . . . . .		29,468	69,191	1,236
1929 . . . . .		25,173	71,157	1,036
1928 . . . . .		23,747	67,297	995

In the autumn of 1931 the total area of 106,998,000 acres was to be distributed according to the plan as follows : wheat 37,066,000 acres ; rye 67,708,000 acres ; barley 1,236,000 acres and the remainder to sunflower seed and other oleaginous crops. During December, weather conditions were normal and except in some southern regions of the Union (Transcaucasus, central Asia), the fields were covered with snow. On January 1st purchases of cereals had been effected to the extent of 90 % of the annual plan.

*Argentina* : Weather was not very favourable during the harvest, work being interrupted by frequent rain. Wheat is of good quality. A large oats export is probable this year owing to the good condition of pastures.

(Telegram of 19 January) : The satisfactory results of the wheat harvest both in quantity and quality are confirmed, as also the very satisfactory results as to quantity and excellent results as to quality for oats, barley and rye.

*United States* : Crop conditions of winter wheat and rye (for grain) on December 1 according to the system of the United States were 79.4 and 81.0 respectively compared with 86.3 and 82.6 on December 1, 1930 and 83.3 and 87.5, the average December 1 conditions for the period 1920-1929. Condition of winter wheat was the lowest December condition since 1890 with the exception of 1917 and 1921. In general, condition was above average in the principal soft winter wheat area but below average in the remainder of the country. December condition of rye was the lowest for that date on record since 1890.

Condition was lower than on the corresponding date of the previous year in the southern States east of the Mississippi and in practically all States west of the Mississippi river except Texas and Oklahoma. Condition was particularly low in the north-western drought area where moisture was insufficient for satisfactory germination.

In the week ended on December 23 winter wheat was in good to excellent condition in the main sections of the belt. Growth was stimulated by the absence of frost. Snow was scarce. At the end of the month cooler weather was desirable as the crop was forward for the season. The abnormally mild weather during the last week of December with generally ample soil moisture throughout the main winter wheat belt resulted in continued growth. In some parts of this area, notably in Kentucky, some lower Ohio Valley sections and in Kansas wheat had become too rank, while in northwestern sections local heaving was noted. There was an almost complete absence of snow cover in more northern districts from the Lake region to the Rocky Mountains but in the central Rockies the grain was mostly covered. In the Pacific Northwest further precipitation occurred, adding to the soil moisture, but parts of the wheat areas were without snow cover; condition remained satisfactory. In the first week of January weather in the winter wheat States was generally favourable. On January 13 snow cover was reported in northern, western and central sections of the winter wheat belt and rainfall in southern and eastern sections.

The weather in the week ended on January 21st was mild. Winter wheat was growing rapidly. More snow cover was desired in many sections.

*Mexico* : During November, sowings were effected under good conditions in the North and Centre. It is stated that the area sown to wheat this year will be considerably smaller than that of last year, due on the one hand to the fall in wheat prices on the world market and on the other, to the lack of necessary soil moisture.

*Uruguay* : Weather conditions in recent months have been particularly favourable to cereal crops. A heavy crop is forecast.

*India* : In the Punjab the weather during December was dry; crop condition on January 1 was estimated at 95 % of the normal compared with 91 % on January 1, 1931. Similar weather conditions prevailed in December in the United Provinces where crops were doing well at the end of the month and prospects were favourable.

*Japan* : On 1 December the crop condition of wheat and barley were generally considered to be average after the generally favourable weather conditions experienced in the previous month. — Telegram January 18 : Barley and oats, favoured by the weather, are developing well.

*Palestine* : The opening rains of the season have been heavy in places, but light and local in parts of Southern Palestine. Heavy rains fell both in Beersheba and Gaza sub-districts, and early crop prospects are better than they have been for some years. In the coastal region of Northern Palestine large areas of *afir* wheat which had germinated early died off and had to be resown. Ploughing and sowing is in full swing throughout the country. A good germination of *afir* wheat and barley is noted. The rains of the first week of December were badly needed and were of great benefit to such crops as had germinated after the earlier light showers. Ploughing and sowing of winter wheat is in progress.

Sowing of winter barley has commenced in the Gaza and coastal areas. Ploughing and sowing of oats is completed. Very cold weather at end of December caused some frost damage.

*Syria and Lebanon* : In the State of Syria sowings have been retarded by rain and germination has taken place only of crops on irrigated land. In Lebanon sowing has not yet been completed owing to the lack of rain. In the government of Latakia sowing has been effected under average conditions ; the soil is dry and germination is irregular having been checked by the drought which has persisted for several months.

In the Djebel-Druze area autumn sowings were effected under good conditions. Germination is regular. Rather heavy rains at the beginning of December made the soil sufficiently workable and facilitated field operations

*Algeria* : Bad weather has persisted since the beginning of December ; it has only been interrupted by two very short periods of fine weather in the last ten days of the month. The delay to sowings caused by the November drought has consequently been greatly increased.

In the departments of Algiers and Oran conditions at the beginning of January were average and thanks to some fine days the peasants were able to nearly complete sowings under fairly good conditions. In the East, in the department of Constantine, the situation was on the contrary poor, considerable delay having been incurred, especially by the natives ; due to the wet state of the soil advantage could not be taken of the fine periods to push on sowings and some will have to be effected after the proper period.

Sprouting was regular until the end of December in the West and Centre, favoured by alternate rains and dry cold but at the beginning of January it was checked by further rain and excessive soil moisture together with low temperatures. In the department of Constantine, similar but more accentuated and persistent conditions following the November drought, created a poor situation for the sowings.

*Egypt* : Weather conditions during December were favourable to sowing, germination and growth of wheat and barley. Sowing is over. Some normal and early-sown areas were manured and watered before the winter-closure of canals. Germination and growth are satisfactory. Crop condition on 1 January was 100, as in 1931 and 1930.

*French Morocco* : A long period of drought set in after the heavy October rains. Sowing was slowed up and sometimes interrupted and considerable delay has been incurred ; peasants in southern regions have begun to sow in dry soil, hoping for early rains.

Sowings in the North, germination of which had been favoured by early moisture, began to suffer severely ; the latest sowings sprouted only very slowly and irregularly.

At the end of December, fairly well distributed showers improved the situation.

*Réunion* : Up to the end of November drought hindered all sowings and the rains at the end of the month were insufficient.

*Tunis* : The floods caused by the torrential rains have destroyed the crop in certain areas ; especially extensive damage has been caused in the high plateaux where frosts also occurred.

Sprouting has not been very regular in the North but fairly regular in the Centre and South.

*Union of South Africa* : Despite the general rains in November periods of warm sunny weather enabled harvesting of winter crops to proceed without serious difficulty.

Except in the Transvaal, where serious damage was caused in certain districts by late frosts, good average to bumper yields are expected. Very little damage appears to have been caused by rust and previous drought.

In the Western Province no rain but much heat and wind were experienced in November; harvesting was completed and threshing begun; excellent reports were received, record yields being obtained in many cases, especially in the eastern section of the province

*Australia* (Telegram of 14 January): There is no change in the wheat prospect since the last report.

## MAIZE

*Argentina*: The December rains were exceptionally favourable. In the North crops have made good progress. It is considered that there will be a considerable increase in area sown this year. It appears that farmers have reduced the wheat area with the intention of increasing that of maize. — Telegram of 19 January: Damage has been caused by locusts in northern Cordoba, Entre Rios and the West, where the crops are suffering from drought. Rain is generally needed.

*United States*: The latest statistics of the production of maize for different purposes in 1931 with relevant comparisons are as follows:

	1931	1930	Average 1925-29	% 1931 1930 = 100	Av. — 100
<i>Area (thousand acres)</i>					
Maize for grain . . . . .	88,870	84,546	84,309	105.1	105.4
Maize for silage . . . . .	4,474	4,744	4,171	94.3	107.3
Maize for hogging down, grazing and fodder . . . . .	11,626	11,453	11,108	101.5	104.7
<i>Production.</i>					
Maize for grain . (ooo centals)	1,228,961	961,734	1,286,382	127.8	95.5
(ooo bushels)	2,194,574	1,717,383	2,297,112		
Maize for silage . (ooo centals)	657,200	597,980	614,780	109.9	106.9
(ooo sh. tons)	32,860	29,899	30,739		

The 1930 maize crop was very small due to drought and production of maize for grain in 1931, although 27.8 % above that of 1930 was 4.5 % below the average. Production of maize for silage does not vary so much as farmers, as far as possible, increase the acreage cut for silage in years of low yield and decrease the acreage in years of high yields.

*Dutch Guiana*: Owing to the late harvesting of the maize crop and to the subsequent drought, the new sowings have been delayed.

*Indochina*: In Annam, the crop harvested in the North was mediocre; sowing has extended in the centre. In Cochinchina yields have been satisfactory. In Cambodia, the crop, although harvested under fairly good conditions, was below the average.

## Maize.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931 — 1931/32	1931	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 — 1931/32	1931
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930 — 1931 = 100	Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 — 1931 = 100	Aver.
	1,000 acres					1,000 centals			1,000 bushels of 56 lbs				
Austria . . .	148	143	146	103.9	101.7	3,814	2,663	2,490	5,917	4,766	4,447	124.4	133.1
Bulgaria . . .	1,676	1,689	1,671	99.2	100.3	21,983	17,088	14,713	39,256	30,615	26,274	128.6	149.4
Spain . . .	1,052	1,106	1,057	95.2	99.6	14,786	16,152	18,144	24,403	28,844	23,471	91.5	112.5
France . . .	...	832	848	...	...	13,245	12,333	9,428	23,653	22,023	16,837	107.4	140.5
Hungary . . .	2,735	2,605	2,662	105.0	102.8	31,021	31,021	39,546	57,605	55,394	70,618	104.0	81.6
Italy . . . (s)	3,426	3,490	3,541	98.1	96.7	41,519	62,332	51,754	74,142	112,200	92,418	66.1	80.2
Italy . . . (t)	288	255	218	93.4	109.4	2,272	3,008	2,013	4,057	5,362	3,595	75.7	112.0
Poland . . .	243	233	217	104.3	111.7	2,231	1,847	1,040	3,984	3,290	3,464	120.8	115.0
*Portugal . . .	865	868	827	99.6	104.6	...	9,364	7,950	...	16,722	14,196	...	...
Rumania . . .	11,749	10,939	10,606	107.4	110.8	140,214	99,648	99,979	250,384	177,942	178,534	140.7	140.2
Switzerland . . .	3	3	3	79.2	76.4	66	64	84	118	114	150	103.4	78.5
Czechoslov. . .	368	364	344	101.2	107.0	4,899	5,479	5,363	8,748	9,788	9,577	89.4	91.3
Yugoslavia . . .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	126,688	136,395	120,279	92.9	105.3
Total Europe . . .	28,628	27,756	26,888	103.2	106.5	347,732	338,511	307,810	620,955	586,627	549,664	105.9	113.0
*U. S. S. R. . .	9,742	9,684	8,386	100.6	116.2	...	...	79,114	...	...	141,275	...	...
Canada . . .	181	161	174	81.2	75.2	3,039	3,263	3,703	5,426	826	6,613	93.1	82.1
United States . . .	104,970	100,743	99,560	104.2	105.4	1,431,843	1,153,704	1,537,197	2,556,963	2,060,185	2,745,001	124.1	93.1
Mexico . . .	7,989	7,599	7,709	104.5	103.0	42,539	30,353	44,001	75,962	54,201	78,574	140.1	96.7
Total N. Amer. . .	113,040	108,503	107,443	104.2	105.2	1,477,421	1,187,320	1,581,901	2,638,251	2,130,212	2,830,788	124.4	93.2
China . . .	...	...	...	...	...	...	...	...	...	...	...	...	...
Manchuria . . .	2,441	2,139	2,469	114.1	98.9	37,754	35,030	37,848	67,418	62,554	67,586	107.8	99.8
Syria and Leb. . .	67	61	121	109.7	55.2	770	600	1,370	1,376	1,071	2,446	128.5	56.2
Algeria . . .	20	24	25	81.5	79.7	118	164	144	211	292	257	72.1	82.1
Eritrea . . .	22	22	13	100.0	166.7	132	198	79	236	354	142	66.7	166.7
Kenya (1) . . .	196	206	201	94.9	97.6	2,021	3,299	2,475	3,610	5,892	4,420	61.3	81.7
Fr. Morocco . . .	837	649	561	129.0	149.3	2,080	3,354	2,978	3,715	5,990	5,309	62.0	70.0
It. Somaliland . . .	14	40	39	35.3	36.4	150	530	426	269	946	760	28.4	35.4
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	108	197	236	192	83.3	102.5
Total Africa . . .	1,133	978	884	115.6	128.6	4,611	7,677	6,205	8,238	13,710	11,080	60.1	74.3
*Chili . . . . .	89	92	88	90.7	101.0	...	1,516	1,229	...	2,707	2,194	...	...
Grand Total . . .	145,909	139,437	137,805	104.2	105.4	1,868,288	1,559,138	1,938,134	3,386,238	2,784,174	3,460,964	119.8	96.4

\* Countries not included in the totals. — (s) For the few countries for which figures are still lacking, the data of area in 1930 have been utilised. — (s) Late crop («maggengo»). — (t) Early crop («cinquantino»). — (1) European crop. — 2) Maize and sorghum.

*Egypt* : Weather conditions during December have been favourable to maturity of *Nili* maize. Harvesting was over in some localities and is progressing. Cobbing, drying and storing are still progressing. Crop condition on 1 January was 100, against 101 on 1 December and 1 January 1931.

*Réunion* : The crop has been largely lost through drought.

*Union of South Africa* : As a result of the very general and soaking rains during November practically throughout the Union the prospects for the present summer season are most favourable. Ploughing and planting have made good progress under ideal conditions.



## RICE

Information concerning the probable production of 1931-32 in the major exporting countries has considerably increased during the past month.

In Burma the crop harvested in December and January, which makes up all but a small fraction of the total production and appears on the market in the latter month, was estimated in December at 9,928 million pounds milled rice, a decrease of 12.8 % on the corresponding estimate for 1930-31 and the lowest figure since 1923-24. To the decrease in area sown by 2 3 % to 12,518,000 acres was added the failure of the late rains. Though most of the crop had been sown or transplanted a month late conditions had subsequently been favourable and up to the end of October the position remained satisfactory. November, however, was completely rainless except north of a line from Minbu to Yamethin — that is, outside the main rice-growing area — and humidity was everywhere very deficient. The export surplus of 1931-32 has now been estimated and in the following table comparative figures for the preceding five seasons (April-March) are given, together with data of arrivals by rail and boat at Rangoon and Bassein, shipments from Rangoon to foreign ports and to India, and total exports from Burma. All the data of crop movement are given for the calendar years following the production year, the overlap being negligible since the movement of the new crop begins in January.

### *Million pounds milled rice*

	Estimated export surplus of Burma	Arrivals by rail and boat at Rangoon (1)	Export from Rangoon (2)	Total exports of Burma (2)
1931-32 . . . . .	5,853	...	...	...
1930-31 . . . . .	7,063	4,646	5,412	...
1929-30 . . . . .	6,153	4,888	5,412	7,202
1928-29 . . . . .	5,824	4,794	4,588	6,198
1927-28 . . . . .	6,086	4,791	4,646	6,668
1926-27 . . . . .	6,525	4,850	4,968	7,220

(1) "5 parts cargo rice" i. e., 4 parts husked rice and 1 part rough rice.

(2) almost exclusively milled rice.

It appears that the amounts available for export are normally somewhat underestimated, the amounts of rough rice and cargo rice in the exports not being sufficient to account for the fact that exports in recent years have always been greater than the corresponding estimates of export surplus. As the exports from Rangoon in the four years 1927-30 amounted to 72 % of the total from Burma the total export for 1931 may be estimated at about 7,515 million pounds. It does not appear, therefore, that there is any great carryover from the 1930-31 crop despite reports of a holding tendency on the part of growers. The estimated surplus from the 1931-32 crop available for export is very

much less than that from the 1930-31 crop so that on the supply side the situation is more favourable than at this date last year.

It is still too early to have data concerning production in Indo-China, where in most areas the main harvesting season is still in progress. In Cochin-China, where the crop is harvested in January and February, the unsatisfactory rainfall conditions, added to the decrease in area, seem likely to result in lowered production. In Cambodia rainfall has been adequate. In Tonkin the crop of the second semester, reaped in November and December, was expected to be at least equal to the average, while in Annam and Laos drought seems to have had a serious effect. On the whole, therefore, present indications point to a decrease in the total production of Indo-China. Stocks in the hands of growers still, however, exercise a depressing influence on the market.

### Rice.

COUNTRIES	AREA					PRODUCTION							
	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32		1931/32	1930/31	Aver. 1925/26 to 1929/30	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32	
				1930/ 1931	Aver- age = 100							1930/ 1931	Aver age = 100
1,000 acres					1,000 centals			1,000 bushels of 45 lbs.					
Bulgaria . .	14	17	18	84.7	78.7	290	366	329	645	814	730	70.3	88.4
Spain . . .	113	120	121	94.2	93.6	5,869	6,392	6,743	13,042	15,316	14,985	85.2	87.0
Italy . . .	346	361	349	96.0	99.3	13,918	14,333	14,652	30,025	31,850	32,559	97.1	95.0
Portugal . .	37	36	30	101.7	123.4	...	546	487	...	1,212	972	...	...
Unit. States.	970	959	948	101.1	102.3	20,256	19,935	18,408	45,014	44,299	40,905	101.6	110.0
China: Man- churia . .	495	510	522	97.0	94.8	7,002	6,883	6,781	15,560	15,296	15,060	101.7	103.8
Formosa { a)	677	660	615	102.7	110.1	14,474	13,892	12,208	32,164	30,871	27,128	104.2	113.6
{ b)	888	858	797	103.5	111.5	13,149	15,500	13,971	29,220	34,444	31,046	84.8	94.1
Korea . . .	3,963	3,970	3,855	99.8	102.0	63,437	76,746	59,472	140,968	170,543	132,158	82.7	106.7
India . . .	77,429	74,102	73,766	104.5	105.0	...	1,089,870	1,048,178	...	2,421,886	2,329,239	...	...
Japan . . .	7,952	7,938	7,787	100.2	102.1	219,386	266,620	237,020	487,514	502,477	526,700	82.8	92.6
Java and s	7,742	7,617	7,391	101.6	104.8	103,838	108,312	104,758	230,747	240,688	232,779	95.9	99.1
Madura { t	1,087	1,188	1,101	91.5	98.7	9,259	10,309	9,204	20,576	22,909	20,458	89.8	100.6
Siam (1) . .	(2) 3,558	(2) 4,034	(2) 3,543	88.2	100.4	48,001	58,018	54,454	106,667	128,925	121,007	82.7	88.1

a) First crop. — b) Second crop. — s) Irrigated rice. — t) Unirrigated rice. — (1) Seven inner circles, of which the production represents about three-fifths of the total production of Siam. — (2) Area to be harvested.

Details are now available regarding the crop in Siam, harvesting of which is generally completed in January. The area planted in the seven inner circles, which produce three-fifths of the total production and practically all the rice exported, shows, like that in Burma, thanks to the poor returns for last year's crop, an interruption in the normal upward trend; at the end of November it was estimated at 4,428,000 acres, 3 % less than the final estimate of 1930-31 and no great increase was expected in the later estimates this year. Production of milled rice is calculated at 3,600 million pounds, a decrease of 17 % on that of 1930-31, which was, however, a record, and of 12 % on the average of the five years ending 1929-30. The details now available indicate the causes of this decrease. In the first place the area damaged is large, being estimated at 870,000 acres, no less than 20 %, so that the area to be harvested is 12 % less than last season. As appears from the following table, the proportion damaged varies greatly, climatic conditions being much more unreliable than in Burma. In the seven inner circles the proportion damaged in 1930-31 was only 11.7 % against the record of 23 % in 1928-29.

*Seven inner circles of Siam.*

	Area planted (1,000 acres)	Area harvested (1,000 acres)	% damage
1931-32 . . . . .	4,428	3,558	19.6
1930-31 . . . . .	4,624	4,081	11.7
1929-30 . . . . .	4,515	3,508	22.3
1928-29 . . . . .	4,262	3,282	23.0
1927-28 . . . . .	4,337	3,513	19.0
1926-27 . . . . .	4,245	4,071	4.1
1925-26 . . . . .	4,077	3,422	16.1
1924-25 . . . . .	4,065	3,745	7.9
1923-24 . . . . .	3,863	3,274	15.2

As in Burma, the late rains, particularly in October, were poor and, though the crop had recovered from the backwardness of the rains in the early part of the season, there has been, in addition to the destruction of a high percentage of the area sown, a general lowering of yields; the average yield, already low in the last three years, shows a further fall and is estimated at only 1,349 lb. rough rice per acre. The following table shows the average yields for the seven inner circles for nine years.

*Seven inner circles of Siam.*

	Average yield rough rice (lb. per acre)
1931-32 . . . . .	1,349
1930-31 . . . . .	1,436
1929-30 . . . . .	1,419
1928-29 . . . . .	1,436
1927-28 . . . . .	1,693
1926-27 . . . . .	1,693
1925-26 . . . . .	1,460
1924-25 . . . . .	1,737
1923-24 . . . . .	1,518

The carryover of last season's crop is estimated at 500 million pounds of milled rice against 340 million pounds at the beginning of 1930-31. Adding this amount to the above estimate of the current season's production and deducting 2,000 million pounds for interna consumption and seed, the surplus available in the seven inner circles for

export from the 1931-32 crop is approximately 2,100 million pounds of milled rice against 4,300 million in 1930-31. The above official estimate of consumption is, however, considered by some authorities as probably too small.

The northern and north-eastern circles, where reaping is generally completed in October, will have little surplus available but in any case the glutinous rice there predominantly produced is not of a kind readily exportable ; these circles are expected to have sufficient for their own needs. The southern circles, however, which normally complete their harvest in February, are expected to have a small deficit, which will probably be met as usual by imports from Burma.

The December estimate for India, excluding Burma, is 68,691,000 acres against 65,939,000 in 1930-31, an increase of 4.2 %, increases being indicated in all provinces save the United Provinces and Bombay and an increase in production being reported in the latter also. The Bengal production of winter rice, the main crop, was estimated in December to be 1.1% less than last season at the same date, despite the increase in area sown, flood damage having occurred in July in the riparian tracts in the east and north of the province ; estimated production of the autumn crop shows an increase of 3.9 %. In Bihar and Orissa the more important winter crop shows an increase of 1.9 %, corresponding exactly to the increase in area sown, while the autumn crop was, despite a slight decrease in area, estimated to be 4.0 % larger than in 1930-31. In Madras production figures were not available in December but yield was reported to have been reduced in seven districts either by heavy rains and floods or by insufficient rain and water-supply ; the increase in area according to the second estimate is only 2.5 % against the first estimate of 4.0 %. Thus, while conditions have been less satisfactory in Madras and the United Provinces, India proper seems as a whole likely to attain last year's level of production.

Now that it is definitely known that there has been a marked decline in the production of Siam, much more pronounced than in that of Burma, while unfavourable weather has further reduced the crop in the latter country and seems likely to have a similar effect in much of the Indo-Chinese area, the situation on the supply side may be said to be somewhat more favourable than it could be said to be last month. On the demand side, however, prospects still remain very doubtful.

C. J. R.

\* \* \*

*Dutch Guiana* : The continual rain has been favourable to rice crops and it is hoped that the late sowings will give satisfactory yields. It is estimated that production in 1931-32 will in general be larger than in 1930-31.

*India* : In Bengal weather during December was mostly dry ; reaping of winter paddy proceeded briskly and the sowing of spring crops was fast approaching completion ; at the end of the month prospects for standing and spring crops were satisfactory. In Bihar and Orissa the weather in the first half of December was dry ; in the latter half of the month light rains fell in some districts and at the end of the month crops were in good condition. In Madras, moderate to heavy rain fell during December in parts of the Carnatic, the central districts and the South of the Presidency. At the end of the month the condition of standing crops was fair.

*Indo-China* : Drought has generally hindered transplanting of the second crop but the duration of its effects has varied according to region. In Tonkin, despite the delay in transplantings, the very early rains allowed operations to be completed under good

conditions and transplantings of late varieties to be prolonged. The area planted is also greater than normal and a crop at least equal to the average was expected. In Annam conditions have varied greatly; save in the south, the drought has reduced the area transplanted and has been very prejudicial in a number of sectors so that, on the whole, the crop of the second semester appears to be mediocre.

In Cochin-China the rainfall régime has been very variable, deficitary in the majority of provinces but excessive in some others. Consequently the condition of transplantings and standing crops varied greatly. In Cambodia the rains, more or less abundant according to region, permitted all the fields to be brought under cultivation. The situation was satisfactory. In Laos the drought hindered the transplanting of an important part of the lowland fields in some provinces; other provinces suffered from lack of water. Condition of upland rice was satisfactory.

*Egypt* : Harvesting of *nili* rice is over. Threshing, winnowing and storing are in progress. The yield per acre is normal.

## POTATOES

*France* : Although the crop is abundant, it leaves much to be desired from the point of view of quality as the summer humidity gave rise to rotting in all districts where treatment was not applied to check mildew. Keeping quality is not good; the farmers are hastening to sell and offers are very abundant, contributing to the fall of prices to a very low level.

*Italy* : The fields are being prepared for the planting of early potatoes.

*Argentina* : Weather conditions favoured re-planting of potatoes in the Province of Mendoza, where frosts in November almost completely destroyed the crop. Condition is generally good and a good crop is anticipated.

*Indo-China* : In Tonkin, the appearance of potatoes was good. In Annam, new planting was effected in the rice fields which could not be transplanted owing to the drought.

*Palestine* : Planting of potatoes is in progress. An increased area under this crop is noted. Comparatively large quantities of "seed" of European varieties have been imported.

*Algeria* : Up to the end of December sowings of early varieties, while they had suffered some hail damage, had greatly profited by the frequent showers; sprouting was slow but regular. In the last days of December and the first days of January storms caused more serious damage.

*Réunion* : Plantings made in March-April gave very poor results owing to the drought and cold; those made in September were "burnt" by hoar-frost.

Potatoes.

AREA					PRODUCTION							
1930	Aver. 1925 to 1929	% 1931 1931/32	1931		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	
1930/31	1925/26 to 1929/30	1930 1930/31	Aver. 1931 = 100		1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 1930/31	Aver. 1931 = 100
1,000 acres				1,000 centals			1,000 bush. of 60 lbs.					
6,980	6,945	100.7	100.5	967,091	1,038,372	840,606	1,611,787	1,730,585	1,400,982	93.1	115.0	
59	46	103.0	131.3	4,442	4,849	3,879	7,404	8,081	6,465	91.6	114.5	
407	406	102.6	102.7	47,677	53,842	46,051	79,461	89,401	76,751	88.9	103.5	
402	408	100.0	98.4	60,949	65,310	74,752	101,580	108,847	124,584	93.3	81.5	
35	26	92.9	122.3	1,720	1,852	829	2,866	3,086	1,381	92.9	207.5	
167	173	93.7	90.3	19,842	21,703	21,746	33,069	36,172	36,242	91.4	91.2	
915 (x)	812	...	...	74,499	92,664	(x) 83,804	124,162	154,437	(x) 130,670	80.4	88.9	
168	166	90.7	100.9	18,839	19,028	15,748	31,398	31,713	26,246	99.0	119.6	
346	369	100.4	94.3	...	52,359	52,714	...	87,265	87,854	...	...	
175	171	99.3	101.6	15,997	17,314	16,513	26,661	28,856	27,521	92.4	96.0	
3,500	3,608	...	...	355,320	296,060	314,707	592,189	493,423	524,502	120.0	112.0	
425	503	105.2	88.9	53,017	61,443	72,272	80,861	102,405	120,450	87.8	74.6	
123	144	103.8	89.0	15,658	19,264	21,862	26,006	32,107	36,437	81.3	71.6	
136	154	98.5	87.4	...	19,184	24,962	...	31,974	41,602	...	...	
678	652	105.6	108.9	32,445	40,507	43,333	54,074	67,660	72,221	70.9	74.9	
864	868	101.3	100.7	33,136	43,077	43,839	55,226	71,794	73,064	76.0	75.6	
281	201	106.8	122.7	25,729	21,341	17,086	42,880	40,568	28,476	105.7	150.6	
403	347	101.4	117.0	43,254	41,643	32,287	72,089	69,404	53,810	103.9	134.0	
40	40	90.1	99.3	4,762	3,525	3,818	7,937	5,876	6,363	135.1	124.7	
7	7	90.2	97.0	670	644	599	1,117	1,074	999	104.0	111.8	
117	120	99.8	97.3	18,207	10,886	18,918	30,344	28,143	31,521	107.8	96.3	
397	432	100.9	92.7	56,099	67,016	73,267	94,496	111,691	122,109	84.6	77.4	
6,602	6,125	101.7	100.6	724,832	681,232	583,299	1,208,113	1,135,448	972,146	106.4	124.3	
66	54	94.0	113.4	6,614	12,454	6,689	11,023	20,756	11,147	53.1	98.9	
468	482	101.2	98.2	52,332	39,993	42,587	87,302	66,654	70,976	131.0	123.0	
336	366	97.5	89.4	30,385	39,668	38,039	51,440	66,112	63,397	77.8	81.1	
120	117	94.2	96.7	16,898	13,007	15,633	28,164	21,678	26,054	129.9	108.1	
1,640	1,792	108.4	99.2	189,641	197,324	191,710	316,062	328,367	319,525	96.1	98.9	
25,270	25,011	101.5	102.6	2,372,135	2,912,958	2,623,877	4,786,801	4,854,538	4,373,039	98.6	109.5	
14,378	13,447	103.2	110.1	...	...	962,453	...	...	1,604,057	...	...	
571	532	102.2	105.8	52,305	48,241	44,747	87,175	80,402	74,577	108.4	116.0	
3,038	3,297	111.3	102.6	225,749	190,926	224,716	376,248	333,210	374,520	112.9	100.5	
3,609	3,849	109.9	103.1	278,054	248,167	269,463	463,423	413,612	449,097	112.0	103.2	
18	14	113.6	144.1	946	1,085	1,027	1,576	1,808	1,711	87.2	92.1	
26	25	104.3	108.0	639	917	924	1,066	1,528	1,540	60.7	60.2	
111	93	91.7	108.8	...	9,861	8,134	...	16,435	13,556	...	...	
24	23	93.8	93.4	...	2,900	2,348	...	4,984	4,740	...	...	
23,923	23,899	102.6	102.7	3,151,774	3,163,127	2,895,291	5,252,866	5,271,786	4,825,387	99.6	108.9	

s included in the totals. — s) Early crop. — d) Late crop. — § For the few countries for which the data of area in 1930 have been utilised. — (r) Average 1925 to 1929. — (a) Unmixed crop

SUGAR

of first estimates of probable production of cane sugar in the season 1931-32. The present number, includes a number of countries together contributing 5% of world production.

First estimates have been partly communicated to the Institute by the Governments and partly formulated on the basis of information communicated by the Governments and sugar manufacturers; in the absence of other data, published in consular reports have been taken.

*Production of Cane Sugar.*

COUNTRIES	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	Percentages for 1931-32	
	Thousand centals			Short tons			1930-31 = 100	Average = 100
<b>AMERICA.</b>								
Argentina . . . . .	8,157	8,417	8,811	410,000	420,854	440,541	97	98
Brazil . . . . .	21,104	20,159	19,385	1,060,000	1,007,900	969,247	105	109
Cuba . . . . .	63,934	69,933	104,428	3,200,000	3,496,600	5,221,343	91	161
Ecuador . . . . .	423	425	432	21,160	21,800	21,677	99	98
United States . . . . .	3,120	3,674	1,911	150,000	183,693	95,675	85	163
Guadeloupe . . . . .	816	375	542	41,000	19,000	27,100	218	150
Jamaica . . . . .	1,257	1,279	1,329	63,000	64,000	66,438	98	95
Mexico . . . . .	4,630	5,247	4,242	230,000	262,000	212,109	88	109
Peru . . . . .	10,196	9,480	8,009	509,800	470,000	400,458	108	127
Porto Rico . . . . .	18,629	15,678	13,716	931,000	783,866	685,809	119	136
Dominican Republic . . . . .	8,497	8,125	7,707	424,850	406,237	385,339	105	110
Salvador . . . . .	668	1,024	507	33,289	51,210	25,353	65	131
<i>Total, America . . .</i>	<i>141,489</i>	<i>143,816</i>	<i>171,019</i>	<i>7,080,000</i>	<i>7,187,160</i>	<i>8,550,889</i>	<i>98</i>	<i>83</i>
<b>ASIA.</b>								
Formosa . . . . .	20,270	17,577	13,629	1,013,952	878,841	681,427	115	149
India . . . . .	74,957	71,188	66,869	3,750,000	3,559,000	3,343,390	105	112
Japan . . . . .	1,951	1,763	1,857	97,525	88,153	92,859	111	105
Java . . . . .	54,013	62,663	57,172	2,700,000	3,133,110	2,858,554	86	94
Philippine Is. . . . .	18,960	18,796	16,404	950,000	939,771	820,180	101	116
<i>Total, Asia . . .</i>	<i>170,160</i>	<i>171,987</i>	<i>155,921</i>	<i>8,511,000</i>	<i>8,598,881</i>	<i>7,796,410</i>	<i>99</i>	<i>109</i>
<b>AFRICA.</b>								
Egypt . . . . .	2,646	2,685	2,094	130,000	134,300	104,691	99	126
Mauritius . . . . .	3,858	4,871	5,041	193,000	243,560	252,045	79	77
Reunion . . . . .	661	1,102	1,116	30,000	55,000	55,775	60	59
Union of S. Africa . . . . .	6,515	7,860	5,297	325,746	393,000	264,371	83	123
<i>Total, Africa . . .</i>	<i>13,680</i>	<i>16,518</i>	<i>13,548</i>	<i>679,000</i>	<i>825,860</i>	<i>677,382</i>	<i>83</i>	<i>101</i>
<b>OCEANIA.</b>								
Australia . . . . .	11,900	11,927	11,283	594,000	596,374	564,162	100	105
Hawaii . . . . .	19,120	19,160	17,340	956,000	958,000	867,007	100	110
Fiji Is. . . . .	1,819	2,019	2,002	90,900	101,000	100,088	90	91
<i>Total, Oceania . . .</i>	<i>32,839</i>	<i>33,106</i>	<i>30,625</i>	<i>1,641,000</i>	<i>1,655,374</i>	<i>1,531,252</i>	<i>99</i>	<i>107</i>
<b>General Totals . . .</b>	<b>358,168</b>	<b>365,427</b>	<b>371,123</b>	<b>17,911,000</b>	<b>18,267,275</b>	<b>18,555,933</b>	<b>98</b>	<b>97</b>

(1) Approximate data.

As was indicated in the December Report the forecast of production for the season 1931-32 is only a little below that for the season 1930-31. The decrease should be 2 % for America and 1 % for Asia and for Oceania. For Africa the decrease should be 17 % but as the sugar production of that continent is by far the smallest in comparison with other continents, it has little influence on the total.

The total world production of cane sugar for the season 1931-32 is at present estimated to be 2 % smaller than in the preceding season and 3 % below the five-year average of 1925-26 to 1929-30.

As regards beet sugar some modifications have been made in the estimates previously published ; those for Belgium, the Irish Free State and Poland are the most important. For these countries the provisional data furnished directly by the respective Governments have since been modified on the basis of new data communicated by the same Governments and of the latest estimates of the sugar manufacturers' associations.

The largest change has been made in the figure for the U. S. S. R. which has been reduced by about 20 %. The figure published in previous Reports until last month was an official estimate made a long time before the beet harvest and based on the

## Production of Beet Sugar (raw).

COUNTRIES	Production 1 September-31 December				Total production during the season						% 1931-32	
	1931-32	1930-31	1931-32	1930-31	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1931-32 (2)	1930-31	Average 1925-26 to 1929-30	1930-31 = 100	Average = 100
	thousand centals		short tons		thousand centals			short tons				
Germany . . . . .	(2) 31,280	(2) 88,350	(2) 1,582,965	(2) 1,017,464	34,034	56,162	38,741	1,734,200	2,808,077	1,937,038	62	89
Austria . . . . .	3,370	2,932	168,950	146,584	3,441	3,313	2,185	182,000	165,620	100,260	110	167
Belgium . . . . .					4,496	6,138	5,949	224,792	306,894	297,440	73	76
Bulgaria . . . . .	(3) 507	(3) 1,084	(3) 25,400	(3) 54,199	568	1,204	602	28,397	60,205	30,090	47	94
Denmark . . . . .					2,756	3,090	3,303	138,000	185,000	165,147	75	88
Spain (4) . . . . .	(2) 2,390	(2) 2,105	(2) 119,496	(2) 427,413	6,393	6,360	4,813	320,000	318,149	210,638	100	138
Irish Free State . . . . .					125	468	436	6,257	23,390	21,704	27	29
Finland . . . . .	(2) 83	(2) 82	(2) 4,134	(2) 4,079	88	85	60	4,400	4,267	3,441	103	128
France . . . . .	(2) 12,232	(2) 12,081	(2) 611,608	(2) 604,037	18,864	26,034	18,258	943,200	1,301,712	912,883	72	103
Great Britain . . . . .	5,902	8,461	295,084	423,025	6,504	9,688	4,032	325,000	484,369	201,611	67	161
Hungary . . . . .	(2) 2,730	(2) 4,249	(2) 136,238	(2) 212,434	3,417	5,154	4,386	171,000	257,712	219,817	66	78
Italy . . . . .				(2) 423,981	7,061	9,382	7,030	308,000	460,090	351,967	85	113
Latvia . . . . .					237	132	(5) 204	14,300	6,625	(5) 10,185	216	141
Netherlands . . . . .	(2) 3,642	(2) 4,957	(2) 182,104	(2) 247,839	3,558	6,359	6,212	193,000	317,958	310,576	61	62
Poland . . . . .	(2) 10,105	(2) 10,673	(2) 505,261	(2) 533,637	10,849	17,119	15,045	542,459	855,949	752,221	63	72
Rumania . . . . .					1,323	3,620	2,745	70,000	181,010	137,268	37	48
Sweden . . . . .					3,153	4,112	2,881	158,000	205,618	144,082	77	109
Switzerland . . . . .					132	126	152	7,000	6,300	7,600	105	87
Czechoslovakia . . . . .	17,722	24,680	886,080	1,238,987	17,722	25,173	26,016	886,089	1,258,614	1,300,768	70	68
Turkey . . . . .					353	214	101	18,000	10,700	5,028	165	351
Yugoslavia . . . . .					1,903	2,264	2,082	95,132	113,198	104,109	84	91
Total, Europe . . a)					129,076	186,815	145,251	6,459,226	9,340,757	7,202,406	69	89
U. S. S. R. . . . .					33,069	38,288	24,006	1,650,000	1,914,400	1,203,288	86	137
Total, Europe . . b)					162,145	225,103	169,257	8,109,226	11,255,157	8,405,694	72	96
Canada . . . . .					1,058	1,075	769	53,000	53,793	38,435	98	138
United States . . . . .					21,022	25,979	21,428	1,201,000	1,290,000	1,071,390	92	112
Totals, North America					22,080	27,054	22,197	1,254,000	1,343,783	1,109,825	93	113
Korea . . . . .					37	22	13	1,837	1,109	685	166	289
Japan . . . . .					601	532	545	30,030	26,583	27,231	113	110
Total, Asia . . . .					638	554	558	31,867	27,692	27,866	116	115
Australia . . . . .					114	75	48	5,706	3,752	2,416	152	239
General total . . { a)					154,908	214,498	168,954	7,750,739	10,734,964	8,402,513	72	92
b)					187,977	232,786	192,120	9,400,739	12,639,364	9,605,901	74	98

a) Not including U. S. S. R. — b) Including U. S. S. R. — (x) Approximate data. — (2) To the end of November. — (3) To December 15th. — (4) The season begins on 1st July. — (5) Average 1928-29 to 1929-30.

forecasts of the five-year plan. As the quantity of beet delivered to the factories, was very much smaller than that forecast, the previous estimate has been reduced by 1,000,000 tons.

On the basis of these new estimates, the total production of beet sugar this season is 26 % below that of the preceding season and 2 % below the average of 1925-26 to 1929-30. Excluding the data for the U. S. S. R., the decreases are 28 % and 8 %.

Adding the figures for cane sugar to those for beet sugar, total world sugar production shows a decrease of 12 % compared with the preceding season and of 3 % compared with the average.

Despite the reduction of production forecast, which has to some extent actually taken place for both cane and beet sugar prices have in 1931 constantly declined as may be seen from the table annexed.

After the beginning of November 1930 on the failure of the Chadbourne Conference because Germany did not accept the export quota, sugar quotations gradually diminished



until, at the end of December, they had fallen to one of the low points for the year 1930.

The year 1931 began, on the contrary, with an immediate rise on both the American and the European markets following the acceptance by Germany of the export quota fixed in the Chadbourne plan. This rise was maintained although the estimates of European beet sugar production were considerably higher than the previous ones.

*Sugar Prices.*

DATE	NEW YORK	LONDON	PARIS	HAMBURG
	Cuba centrifugals 96° C and F cents per lb.	Granulated, duty free, shill. per 112 lbs.	No. 3. No. 3 Crystallized frs. per 100 Kgs.	White marks per 50 Kgs.
8 January 1931	1.40	19/9	189.50	6.80
15 "	1.38	19/11	192.50	6.60
22 "	1.40	19/11	183.25	6.60
29 "	1.40	19/9	184.75	6.45
5 February	1.30	19/7	188.75	6.25
12 "	1.30	19/7	194.25	6.30
19 "	1.30	19/9	190.00	6.65
26 "	1.32	19/9	190.50	6.75
5 March	1.25	19/9	189.25	6.65
12 "	1.25	20/-	—	6.60
19 "	1.32	20/-	188.75	6.90
26 "	1.35	20/6	194.00	6.90
2 April	1.33	20/10	200.00	7.05
9 "	1.35	20/10	206.50	7.20
16 "	1.30	20/11	206.25	7.15
23 "	1.25	20/11	208.50	7.00
30 "	1.20	20/8	212.50	6.85
7 May	1.14	20/8	214.25	6.55
14 "	1.18	20/5	—	—
21 "	1.20	20/5	216.50	6.75
28 "	1.11	20/2	217.00	6.60
4 June	1.20	20/7	219.25	6.70
11 "	1.30	20/7	219.00	6.95
18 "	1.35	20/7	221.75	7.00
25 "	1.40	20/7	225.50	7.00
2 July	1.48	20/10	233.75	7.05
9 "	1.44	20/10	233.00	6.95
16 "	1.50	20/7	229.00	—
23 "	1.55	20/4	232.75	—
30 "	1.50	20/4	229.50	—
6 August	1.51	20/4	229.50	—
13 "	1.50	20/4	228.50	—
20 "	1.50	20/1	231.50	—
27 "	1.42	19/10	228.75	—
3 September	1.37	19/10	228.00	—
10 "	1.42	19/7	233.75	—
17 "	1.40	19/4	220.50	—
24 "	1.43	19/10	225.50	—
1 October	1.40	20/9	217.00	—
8 "	1.45	20/9	214.75	—
15 "	1.45	20/9	209.00	—
22 "	1.38	20/9	207.00	—
29 "	1.42	20/9	213.25	—
5 November	1.42	20/3	214.25	—
12 "	1.38	20/3	214.75	—
19 "	1.36	20/3	217.75	—
25 "	1.20	20/-	218.50	—
3 December	1.20	20/3	218.00	—
10 "	1.13	20/6	222.75	—
17 "	1.10	20/6	218.50	—
24 "	1.10	—	217.50	—
31 "	1.20	19/8	218.00	—

Prices remained firm during nearly the whole of January except for some slight fluctuations caused by the difficulties encountered during the negotiations for the Brussels Convention or by the news of sales effected by the U. S. S. R. in India at prices considerably lower than those quoted in Java. At the end of January the decree of the

President of Cuba fixing the quantity of sugar to be produced in Cuba and the quantities exportable to the United States and other countries, contrary to expectations, had no effect on market prices, which in fact showed a slight decrease except in Paris.

In February there were no important variations in prices, which, however, in New York and London were on the average lower than those of January. At the end of the month there was a slight fall in prices due perhaps to some extent to the news of the increase in tariffs in India. In Paris, on the contrary, prices were maintained because customs tariffs were expected to be raised. At the beginning of March prices began to rise and reached a maximum at the middle of April; this movement is due to various causes but principally to the news of a supposed favourable turn in the negotiations in Java to bring about the participation of the latter in the Chadbourne plan and to the first estimates of beet sowings in Europe which showed a decided decrease compared with the previous year. The rise in prices is most marked in France where the hope of an increase in customs tariffs was realised by the law of March 20 which was ratified on the 31st by the Senate and introduced a rise in duty of 30 francs per quintal. In France the effect of the increased duty has been so marked that quotations remained unchanged even during the period from the end of April to May during which other countries experienced new decreases after the increase noted at the end of March.

The decrease in quotations (except in France) is attributed to the increased possibility of exports from Mexico and Brazil following abundant sugar production, to the large Cuban stocks and to the efforts made by the Soviet Union to dispose of its sugar; this tendency to fall has not been checked by the news of the further reduced estimates of sugar beet areas in Europe.

At the beginning of June, with the first indication of the Brussels Convention the markets brightened and quotations were first maintained then gradually increased as the news became more exactly known until the period from the beginning of July to the middle of August, when a maximum was reached for the year on the publication of the text of the Convention.

In the meantime, on July 27, by order of the Hamburg Council the exchange was closed because, among other reasons, sugar contracts greatly exceeded those for other products; in fact contracts expiring in December 1931 and May 1932 covered considerable quantities and might have created serious difficulties at the time of liquidation. The closing of the exchange amounted to a forced liquidation of contracts. Monthly prices have been fixed for the period up to June 1932.

After the end of August quotations continued to fall until the end of the year when they touched the lowest point for 1931. On the London and Paris markets the quotations apparently were not the lowest but if account is taken of the fall in sterling since the end of September and of the increase in customs tariffs by 30 francs in France, prices on these two markets were also at minimum levels for the year.

The gradual fall in quotations from the end of August to the end of the year was due to a variety of causes the most important of which was the accumulation of stocks in Java and Cuba where there was reason to fear that it would not be possible to dispose of the whole of the export quota, the improvement of beet production in Europe, the increase of production estimates in some countries producing cane and the increased acreage in India due probably to the raised customs tariff.

On the whole, in 1931, price fluctuations were less wide than in 1930 and the fluctuations in contrast to those recorded in other years were not greatly influenced by normal factors such as the reduction or increase of acreage and production or the improvement or deterioration of crop condition, but quotations were influenced abnormally by the proceedings of the Conferences for the Chadbourne plan, by its application and by

the efforts made to extend its application to other countries — also by the size of stocks which have not been reduced to the extent desired, by the fall in sterling and by general market depression.

E. R.

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*The figures in the following table are supplied by the " Association Internationale Sucrière " of Vienna.*

COUNTRIES	Sugar-beet		Raw sugar	
	1931	1930	1931-32	1930-31
	Centals			
Germany . . . . .	207,282,440	350,364,989	34,684,470	56,162,310
Austria . . . . .	21,514,150	21,239,870	3,640,900	3,312,870
Belgium . . . . .	29,233,000	41,419,380	4,495,000	6,178,540
Bulgaria . . . . .	3,858,000	3,362,650	567,960	1,289,000
Denmark . . . . .	16,253,000	22,648,000	2,080,660	3,699,000
Irish Free State . . . . .	772,000	3,538,000	123,000	573,000
Finland . . . . .	690,500	608,250	92,680	85,340
Hungary . . . . .	18,012,200	34,233,910	2,766,400	5,162,600
Italy . . . . .	54,518,000	73,507,000	7,901,000	9,094,000
Poland . . . . .	60,314,000	102,141,060	10,840,340	17,243,930
Rumania . . . . .	(1) 5,688,000	22,928,000	(1) 838,000	3,616,000
Sweden . . . . .	18,792,840	26,125,170	3,166,110	4,112,400
Czechoslovakia . . . . .	97,553,270	148,087,640	17,707,500	25,194,000
Turkey (in Europe) . . . . .	2,275,570	1,257,000	353,000	214,000
Yugoslavia . . . . .	13,420,380	16,450,080	1,902,600	2,264,000
<b>Total . . .</b>	<b>550,183,360</b>	<b>873,909,990</b>	<b>91,773,560</b>	<b>138,200,990</b>
	Short tons			
Germany . . . . .	10,363,980	17,518,011	1,734,200	2,808,077
Austria . . . . .	1,075,690	1,061,079	182,000	165,642
Belgium . . . . .	1,461,600	2,070,941	224,790	308,923
Bulgaria . . . . .	103,000	418,127	28,397	64,450
Denmark . . . . .	812,000	1,132,400	134,531	185,000
Irish Free State . . . . .	38,000	177,000	6,200	29,000
Finland . . . . .	34,527	34,012	4,633	4,267
Hungary . . . . .	900,600	1,711,072	138,320	258,127
Italy . . . . .	2,725,900	3,075,000	396,100	455,000
Poland . . . . .	3,015,700	5,108,183	542,459	862,185
Rumania . . . . .	(1) 284,000	1,146,400	(1) 42,000	181,000
Sweden . . . . .	939,629	1,306,240	158,304	205,618
Czechoslovakia . . . . .	4,877,507	7,449,281	885,363	1,259,684
Turkey (in Europe) . . . . .	113,777	63,000	18,000	10,700
Yugoslavia . . . . .	671,007	822,943	95,132	113,198
<b>Total . . .</b>	<b>27,508,507</b>	<b>43,694,489</b>	<b>4,589,429</b>	<b>6,910,871</b>

(1) Data referring to only five of the six factories working in 1931-32.

*Irish Free State* : The 1931-32 campaign ended in December.

*U. S. S. R.* : The figure previously communicated of production of sugar beet in the U. S. S. R. in 1931 (374,787,000 centals or 18,739,000 short tons) was based on an estimate made a long time before the harvest. Some more recent estimates have now been published; according to the data available, production should be below the figure forecast in the plan by 164,024,000 centals (8,201,000 short tons). As the forecast was 472,673,000 centals (23,633,000 short tons), actual production in 1931 should be about 308,648,000 centals (15,432,000 short tons).

Production of sugar, which was at first forecast according to the plan at 55,777,000 centals (2,789,000 short tons) should also be reduced as a result of the smaller beet pro-

duction by over 22,000,000 centals (1,100,000 short tons). There is consequently reason to believe that there will be obtained in 1931-32 about 33,069,000 centals (1,650,000 short tons) compared with 38,288,000 (1,914,000) in the preceding season.

*United States* : Sugar content of the beets was higher than in either 1930 or 1929.

The area of sugar-cane for sugar in Louisiana in 1931 was 154,000 acres compared with 149,000 in 1930 and 132,000 on the average for 1925-29 ; percentages : 103.4 and 116.4. Production of cane for sugar was 46,200,000 centals (2,310,000 short tons) compared with 51,180,000 (2,559,000) in 1930 and 44,580,000 (2,229,000), the average ; percentages : 90.3 and 103.6.

The cane crop was smaller in 1931 although acreage remained about the same ; the crop started growth rather late last spring and was hurt by a protracted dry period in the spring and summer. The outturn of sugar per ton of cane is also lower than last year.

### Sugar-beet.

COUNTRIES	AREA					PRODUCTION									
			Aver. 1925 to 1929	1931				Average 1925 to 1929			Aver. 1925 to 1929	1931		Aver. 1925 to 1929	% 1931/32
	1931	1930		1931/32		1931	1930		1931	1930		1931/32	1930/31		
	1931/32	1930/31	1925/26 to 1929/30	1930 — Aver.	=100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/31 = 100
	1,000 acres					1,000 centals					1,000 short tons				
Germany . . . . .	941	1,194	1,063	78.0	88.6	243,370	328,900	237,119	12,168	16,445	11,856	74.0	102.6		
Austria . . . . .	106	88	62	121.1	171.4	23,534	21,457	13,724	1,177	1,073	686	109.7	171.5		
Belgium . . . . .	140	140	162	100.0	86.4	37,510	41,123	40,705	1,876	2,056	2,035	91.2	92.2		
Bulgaria . . . . .	37	49	35	76.0	106.1	5,291	6,889	4,247	265	344	212	76.8	124.6		
Denmark . . . . .	75	81	93	92.2	80.2	13,208	23,573	24,153	915	1,179	1,208	77.6	75.8		
Spain . . . . .	...	197	181	...	...	65,295	51,197	34,572	3,265	2,560	1,744	127.5	187.2		
Finland . . . . .	5	3	5	161.6	90.3	794	683	773	40	34	39	116.1	102.7		
France . . . . .	640	679	601	95.0	107.0	134,251	104,329	127,346	6,712	9,716	6,307	69.1	105.4		
England and Wales . . . . .	233	347	162	67.1	144.0	44,800	68,130	25,306	2,240	3,407	1,415	65.8	158.3		
Scotland . . . . .	1	2	4	57.4	20.1	114	269	442	6	13	22	42.5	25.9		
Hungary . . . . .	142	183	168	77.3	84.5	22,743	32,210	32,947	1,137	1,610	1,647	70.6	89.0		
Italy . . . . .	270	277	226	97.7	119.8	52,268	67,219	51,465	2,613	3,361	2,573	77.8	101.6		
Netherlands . . . . .	91	142	157	64.2	58.1	22,346	47,127	46,341	1,117	2,356	2,317	47.4	48.2		
*Poland . . . . .	380	457	510	83.1	74.4	...	103,903	92,177	...	5,200	4,609	...	...		
*Rumania . . . . .	50	113	167	43.9	29.7	...	18,708	24,143	...	935	1,207	...	...		
Sweden . . . . .	91	91	78	100.0	116.9	19,842	26,787	19,233	962	1,339	962	74.1	103.2		
Czechoslovakia . . . . .	461	554	675	83.3	66.3	102,872	141,567	157,619	5,144	7,078	7,881	72.7	65.3		
Total Europe . . . . .	(§) 3,430	4,027	3,672	85.2	93.5	793,332	1,051,460	819,292	39,667	52,571	40,964	75.5	96.8		
U. S. S. R. . . . .	3,332	2,533	1,626	131.6	204.9	308,648	334,434	186,268	15,432	16,721	9,313	92.3	165.7		
Canada . . . . .	51	52	46	97.1	111.2	9,180	9,420	8,685	459	471	434	97.5	105.7		
United States . . . . .	720	775	675	92.9	106.6	153,660	183,980	147,093	7,983	9,199	7,365	86.2	107.9		
Australia . . . . .	4	3	2	138.0	193.0	858	627	440	43	31	22	136.8	194.9		
Totals . . . . .	(§) 7,537	7,390	6,021	102.0	125.3	1,270,678	1,579,921	1,161,778	62,534	78,993	58,088	80.4	109.4		

\* Countries not included in the totals. — (§) For the few countries for which figures are still lacking the data of area in 1930 have been utilised.

*Formosa* : On December 1, owing to seasonable weather conditions and the relative absence of noxious insects and moulds, crop prospects were good on the whole. In the southern part of the island cutting has been started. Planting of new cane is progressing favourably and growth is in general healthy.

*India* : In the United Provinces no rain fell during December and at the end of the month crops were doing well and prospects were favourable. In the Punjab De-

cember weather was also dry ; at the end of the month condition of crops was average to good. In Bihar and Orissa the weather in the first half of December was dry ; in the latter half of the month light rains fell in some districts and at the end of the month crops were in good condition.

*Indo-China* : In Tonkin growth of the crop was satisfactory. In some provinces of Annam the cane was greatly damaged by drought.

*Syria and Lebanon* : The sugar-cane area is 950 acres compared with 670 in 1930-31 and 510 on the average for the four seasons 1926-27 to 1929-30 ; percentages : 141.5 and 186.0. Production, on the contrary, is estimated at only 68,000 centals (3,400 bales) compared with 90,000 (4,500) in 1930-31 and 66,000 (3,300), the four-year average ; percentages : 75.2 and 103.5.

*Egypt* : Weather conditions during December were favourable to maturity. Normal and early-sown areas have completely matured. Some areas are being cut for local consumption and for making molasses. In Assuan the cutting of the early-sown areas has commenced for the supply of the sugar factory at Kom-Ombo which started work on 20 December. Other sugar factories started work on about December 28. The crop is on the whole slightly above the average. Crop condition as on 1 January was 103, the same as on 1 January 1931, against 102 on 1 December 1931.

*Réunion* : The crop has been favoured by dry weather but was backward in most of the plantations. The propagation of mosaic-resistant varieties is taking place slowly.

*Union of South Africa* : The campaign was completed early in December. The rainfall this season over the whole of the sugar belt has been much below normal. November was very dry, with hot winds on the North Coast.

## VINES

The recent estimates of the French-Algerian and Italian productions confine the forecast of the total production of the northern hemisphere between the limits 3,410 million Imperial gallons (4,095 million American gallons) and 3,520 million Imperial gallons (4,227 million American gallons). Excluding the French-Algerian production, the total for the other exporting countries — Italy, Spain, Portugal, Greece and Danubian Europe — should be between 1,650 million Imperial gallons (1,981 million American gallons) and 1,782 (2,140), or at the most equal to that of last year and smaller by at least 220 million Imperial gallons (264 million American gallons) than the average production of the period 1925-29. The total production of central Europe seems to be slightly larger than that of last year and the average.

The quality of the wine seems to be satisfactory everywhere and good in [the Mediterranean regions. The figures indicated above confirm the conclusions arrived at in last month's Crop Report.

Due to the compulsory stocking of part of the wine imported into France and held by merchants and the level of French prices, which is only a little above that of other countries, the French import market will be very limited. It may be stated, in fact, that the exports from Spain, Italy and Greece to France in the first month of the season were greatly reduced. Trade, after an active period following the vintage, is stagnant every-

## Vines.

COUNTRIES	AREA					PRODUCTION							
	1931		Aver. 1925 to 1929	1931		1931		Aver. 1925 to 1929	1931		Aver. 1925 to 1929	% 1931	
	1931	1930		1930	Aver.	1931	1930		1931	1930		1930	Aver.
	1,000 acres		= 100	= 100		1,000 Imperial gallons			1,000 American gallons			= 100	= 100
*Germany. .	204	203	201	100.5	101.4	...	61,895	35,549	...	74,331	42,601	...	...
Austria (1).	78	77	80	101.0	96.8	29,565	26,450	12,738	35,505	31,794	15,297	111.8	232.1
Bulgaria. .	217	205	189	106.0	114.8	61,769	57,744	33,215	74,179	69,345	39,912	107.0	185.9
Spain (2).	...	3,495	3,429	...	...	396,504	400,972	518,520	476,166	481,531	622,606	98.8	76.5
France (3).	3,559	3,465	3,462	102.7	102.8	1,263,033	924,141	1,205,894	1,517,870	1,109,810	1,448,171	136.8	104.8
Greece (2).	...	375	277	...	...	35,482	30,397	56,958	42,611	3 6,504	68,401	116.7	62.3
Italy . (s)	1,955	1,948	2,078	100.4	94.1	...	...	...	...	...	...	...	...
Italy . (d)	8,389	8,529	8,567	98.4	97.9	731,740	799,445	906,147	878,765	900,061	1,088,201	91.5	80.8
Luxemburg.	3	3	4	100.0	81.5	1,936	844	1,063	2,325	1,014	1,277	229.3	182.1
Portugal. .	868	...	856	...	101.4	148,483	129,612	132,445	178,315	155,652	159,054	114.6	112.1
Switzerland.	...	33	35	...	...	14,958	11,078	12,282	17,964	16,907	14,750	106.2	121.8
*Czechoslov.	47	44	42	105.5	111.4	...	10,427	4,864	...	12,521	5,841	...	...
*Syria and Lebanon.	125	126	123	99.2	101.6	—	—	—	—	—	—	—	—
Algeria (1).	852	670	528	127.3	161.5	348,898	298,317	221,277	418,887	358,252	277,743	116.9	150.8
Fr. Morocco	22	22	15	100.0	149.9	5,543	4,176	3,080	6,657	5,015	3,698	132.8	180.0
Tunis . . .	98	87	74	113.1	133.5	15,662	21,998	18,898	18,899	26,417	22,694	71.2	82.9
Totals. . .	—	—	—	—	—	3,011,194	2,663,037	3,074,989	3,616,175	3,200,469	3,692,784	113.0	91.9

\* Countries not included in the totals. — s) Unmixed crop. — d) Mixed crop. — (1) Crop in bearing. — (2) Must; these figures have been calculated in terms of wine on the basis of the coefficient 9/10 and included in the totals.

where, constituting an abnormal situation for the end-of-the-year festive season; only a few regions of Italy such as Emilia and Apulia show normal activity; in France, stocks are largely sufficient and purchases restricted; elsewhere trade is stagnant. Prices remain firm everywhere with a slight tendency to rise; viticulturalists everywhere are expecting an improvement which it seems however can only occur to an appreciable extent in France as a result of the measures taken according to the law of last July.

The only positive element in the commercial situation is the partial destruction of the Argentine crop which may reopen the market of this country to European imports.

The small volume of the production of the southern hemisphere which it seems should not exceed 176-198 million Imperial gallons (211-238 million American gallons) makes the 1931-32 world production smaller by about 220 million Imperial gallons (261 million American gallons) than the five year average but larger by as much than the relatively small production of last season.

The period of intense cold in the latter half of December checked work in most vineyards of the country. Vines suffered from the cold in central Europe and a little also even in the Mediterranean basin.

P. de V.

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*Austria*: Crop condition of vines was 2.4 on January 1 compared with 2.3 on December 1 and 1.8 on January 1, 1931.

*France*: The crop forecasts given in the November and December number are confirmed by the crop declarations, the figures of which are inserted in the table.

In the interpretation of these figures, especially in those of productive area, account must be taken of the statistical effects of the decree of 1 August last, which makes the

enforcement of crop declarations stricter, by obliging growers to indicate also the quantities reserved for household consumption and withdrawn from sale. The number of growers making declarations this year is, in fact, 158,000 or 11 %, greater than last year. This difference goes far to explain the apparent increase of productive area. In 1930 the average area declared by growers was 2.47 acres; this year it is 2.30 acres. This comparison also draws attention to the fact that the crop declarations till now not recorded concern only very small vineyards with poor yields. Their part in the total production may be said to be at most 22 (26) million gallons.

On the basis of the official figures published French wine supplies are about 1,610 (1,930) million gallons, taking into account growers' and traders' stocks. This figure conforms to the approximate estimate made by us last month but since then the application of the law of 4 July 1931 under the decree of 20 December in the form of a segregation of part of the crop, the requisition of alcohol by the State, and obligatory distillation have withdrawn from commerce a quantity totalling about 180 (210) million gallons.

Taking into account these measures, which affect also the Algerian crop, the total metropolitan and North African supplies may be estimated at about 1,670 (2,000) to 1,690 (2,030) million gallons. It may be estimated that the quantity of foreign wines coming on the French market will be hardly more than 40 (50) million gallons, despite the quotas granted to Spain, Italy and Greece; importers are in fact, obliged to segregate part of the foreign wines received, ranging from 7 % to 17 % according to the quantity imported. This measure should check the introduction of foreign wines, already hindered by the fall in prices on French markets.

In all the measures taken under the law for viticultural defence reduce the quantity at the disposal of the trade in the current season to between 1,360 (1,640) and 1,430 (1,720) million gallons. These supplies leave on the market a non-absorbable surplus certainly greater than 220 (264) million gallons but probably less than that weighing on the market in preceding seasons. It is as yet too soon to state the effect on prices of these measures. For the time being prices are firm with a slight tendency to rise. Business has slackened owing to uncertainty as to the exact repercussions of the recent decree and the waiting attitude of the growers. Quantities leaving growers' hands remain below normal and dutiable consumption is relatively high. In the vineyards the prolonged and severe cold, which increased in intensity at the end of year, arrested operations. It is too soon to say whether damage has been caused to the vines.

*Italy* : In the following table are given the definitive data for 1931 of the production of grapes for various purposes, compared with those for 1930 and 1929.

	1931	1930	1929
		(thousand pounds)	
Total production of grapes . . .	12,298,978	12,952,369	14,197,353
Wine grapes for wine-making . . .	11,647,977	12,342,923	13,677,913
Wine grapes for consumption			
in the fresh state . . . . .	438,236	398,116	314,590
Table grapes, fresh . . . . .	187,155	182,568	170,797
Table grapes fresh, for drying . . .	25,609	28,762	34,053
Grapes, dried . . . . .	(8,569)	(9,672)	(11,681)

*United States* : Production of grapes in 1931 was 31,660,000 centals (1,583,000 short tons) compared with 48,770,000 (2,439,000) in the previous year and 47,987,000

(2,399,000) on the average for the period 1925-29; percentages: 64.9 and 66.0. The United States average price in 1931 was better than in 1930 but approximately 15 % below that of 1929.

*Syria and Lebanon*: The total production of grapes is estimated at 2,800,000 centals against 3,536,000 in 1930 and 3,045,000 on the average for the preceding five years. Percentages: 79.2 and 92.0. The crop has been reduced by persistent drought.

*Algeria*: The figure of crop declaration given in the general table indicates a record production, above all expectations, official and private. Unit yield, however, is not very high, only 409 (492) gallons per acre against 445 (535) last season and an average of over 436 (524) for 1925-29.

Area in bearing has grown considerably as may be seen on comparing the data for preceding years. The part played in this growth by the statistical incidence of the viticultural law of 1 August last is certainly not so great as in France. It must, however, be noted that the crop declaration figure is 163,000 acres above the official estimate of last November and that the new figure is also much above even that given for *total area* in 1931 as well as in 1930. There are grounds for believing, therefore, that the *apparent* increase of 183,000 acres on last year's figure, amounting to 27 %, is due to statistical factors at least as much as to actual extension of the vine area in bearing. There are grounds for believing that the effect of this statistical correction on the production estimate is less considerable if not negligible. From the official figures published it follows that Algerian supplies at the beginning of the current season amounted to 387.2 (464.9) million gallons. But the compulsory stocking of part of the crop applied by the decree of 20 December under the law of 4 July 1931 should limit the entry of Algerian wines into France to 231.0 (277.4) to 242.0 (290.6) million gallons. If to this amount are added the quantities requisitioned under the same law for distilling, that absorbed by internal consumption and the very small quantity exported to foreign countries it would appear that the current season will not ensure the movement of more than 286 (343) million gallons; in 1930-31 the movement was 299.2 (359.3) million. There would remain then, at the end of the season over 100 (120) million gallons, though in previous years the total end-of-season stock was limited to about 35 (40) million. In the first two months of the season, October-November, the wine trade was active, quantities leaving growers' hands were relatively very large and movement was easy; on 30 November commercial stocks were below the figure of 30 November 1930. Prices of Algerian wines on the Marseilles market remained above those of French wines with a slight tendency to rise at the beginning of January.

*French Morocco*: A private estimate gives a figure of production exceeding previous official estimates by 8.6 (7.9) million gallons. This production would satisfy about  $\frac{2}{3}$  of the home consumption. Recent plantations should rapidly cover the local needs which at present remain unsatisfied and steps are being taken to prevent any future extension of vineyards. Pruning and other vineyard operations have been effected in good weather without rainfall until the end of December. Up to the end of December preparation of the soil was rendered difficult by the drought. Pruning, which began towards the middle of December was proceeding slowly.

*Union of South Africa*: According to the returns received from producers by the Koöperatieve Wynbouers Vereniging van Suid-Afrika, Bepersk, the following is the



wine production in the Union for 1931, the corresponding figures for 1930 being given for comparison :

		1931	1930
Production of good wine for sale. . .	(Imp. gall.)	3,821,938	4,168,140
	(Amer. gall.)	4,589,804	5,005,561
Production of good wine for own use	(Imp. gall.)	526,669	526,288
	(Amer. gall.)	632,482	632,025
Production of wine for distillation . .	(Imp. gall.)	10,071,481	11,734,800
	(Amer. gall.)	12,094,942	14,092,439
Grapes delivered for conversion to must, syrup, vinegar for distillation etc. .	(1000 centals)	604	556
	(short tons)	30,180	27,804
Brandy (Classes A, B, and C). . . .	(Imp. gall.)	66,421	61,277
	(Amer. gall.)	79,866	73,588
Rebate brandy on farms . . . . .	(Imp. gall.)	10,160	9,525
	(Amer. gall.)	12,201	11,439
Wine for vinegar produced on farms	(Imp. gall.)	56,261	52,705
	(Amer. gall.)	67,664	63,294
Grape juice or syrup . . . . .	(Imp. gall.)	213,995	253,746
	(Amer. gall.)	256,989	304,726

These figures represent the actual production on the farms so that it is impossible to reduce the statistics to a common unit or in all cases to determine its ultimate marketed condition. The difficulty is increased by reason of the fact that a large quantity of wine is delivered to the Vereniging and wine buyers in the form of fresh grapes or syrup.

Taking 20 centals (1 short ton) as equivalent to 127 Imperial gallons (153 American gallons) the totals for 1931 and 1930 are respectively 18,600,000-20,338,000 Imperial gallons (22,337,000-24,424,000 American gallons).

*Australia* : In South Australia the frosts have caused a loss of 15-20 % of the crop. The bunches seem numerous this year and the crop promises to be average. In Victoria prospects are good ; anti-cryptogamic treatment has been carried out.

Exports in the first months of 1931-32 showed a decrease.

## OLIVES

*Italy* : During December the olive harvest made good progress and was terminated almost everywhere. In the areas of larger production the oil is of good quality. Pruning of the trees has begun.

*Palestine* : Picking of olives is completed. Pruning of trees has commenced. At the end of December weather was very cold.

*Syria and Lebanon* : The olive crop was reduced in December owing to damage caused in southern Syria by dry winds from the desert, in Lebanon by the lateness of the autumn rains and in Latakia by persistent drought. The figures of oil production are not yet known.

*Olives and Olive Oil Production.*

COUNTRIES	AREA				ENGLISH MEASURES			AMERICAN MEASURES			% 1931/32	
	1931/32	1930/31	Average 1925/26 to 1929/30	% 1931/32	1931/32	1930/31	Average 1925/26 to 1929/30	1931/32	1930/31	Average 1925/26 to 1929/30	1930/ 1931 = 100	Aver. = 100
	Thousand acres				Thousand centals			Thous- (s) pounds and (t) American gallons			%	%
Spain (1) . . . .	—	4,651	4,296	—	(s) 43,480	18,055	48,446	4,347,904	1,365,493	4,814,563	318.4	89.7
Greece . . . . .	—	—	—	—	(t) 8,309	2,534	9,153	100,187	33,208	120,273	327.9	90.8
Italy . . . . . (a)	1,492	1,492	1,425	100.0	(t) 1,984	1,903	1,662	26,073	25,004	21,855	104.3	119.3
Portugal . . . .	4,131	4,133	4,201	99.9	—	—	—	—	—	—	—	—
United States, .	—	—	—	—	(t) 1,504	—	1,056	10,703	—	13,883	—	142.4
Syria and Le- banon. . . . .	—	—	—	—	(s) 320	400	370	32,000	40,000	36,000	80.0	86.6
Algeria . . . . .	188	187	170	100.5	(s) 1,476	973	1,244	147,622	97,334	124,352	151.7	118.7
Tunis. . . . .	103	109	99	94.3	(t) 464	254	462	6,103	3,334	6,075	182.5	100.5
	—	—	—	—	(t) 1,100	400	880	14,500	5,200	11,600	278.0	125.0

a) Pure crop. — b) Mixed crop. — s) Olives. — t) Oil. — (1) Area bearing. — (2) Excluding the data for some districts.

*Algeria* : Weather conditions until nearly the end of December were on the whole fairly favourable to the olive trees ; in the last few days of December and first few days of January, adverse weather — rain, hail and wind — damaged the crop. *Dacus oleae* caused some damage. Picking is continuing fairly actively but irregularly according to local conditions as the cost is high and market prices are very low.

*French Morocco* : The olive crop is on the whole good and harvesting is proceeding actively.

**COTTON**

The last estimate for the present season published by the United States Government remains unchanged ; the definitive estimate, based on the complete ginning returns will be known in May. Contrary to market expectations the present estimate is only about 73,000 centals (15,000 bales) above that of November. It is notable that since the beginning of the season this is the first time that private estimates have all save one exceeded those of the official report. On the basis of information received in November the Government reduced by 1 % the estimate of area to be harvested ; the new figure is published in the table. Last month the estimate of area to be harvested was based on that made on 1 July for area sown, less the percentage damaged, estimated at 1.5 %. In fact, however, the latter percentage was only 1.1 %, against a ten-year average for 1920-29 of 3.4 %. The last estimate of area harvested plus the area damaged, calculated on the basis of the coefficient 1.1 %, gives, therefore, the area cultivated as on 1 July, which was 40,956,000 acres. The average yield for the United States, has, however, increased in comparison with the preceding estimate, from 197.8 lb. of fibre per acre to 200.1 lb., against 147.7 lb., last year. This year's yield has so far been exceeded only six times, the last in 1914. The average weight per bale of ginned cotton is this year the highest recorded. On the basis of this average it is calculated that the final figure for ginned cotton expressed in bales of 500 lb., gross weight will be over 400,000 bales higher than that expressed in running bales. The cotton season 1931-32 in the United States has been extraordinarily favourable to production. The conditions under which

sowings were made were generally favourable and spring temperatures checked propagation of parasites. The subsequent hot dry weather in summer further diminished insect damage and hastened maturity. Weather remained exceptionally favourable up to the first half of November and harvesting and ginning took place in generally ideal conditions. Only in the latter half of November was the weather less favourable, hindering picking somewhat. The grade, length of fibre and other market qualities of the cotton ginned up to 31 October inclusive are exceptionally high; the amount of fibre of marketable quality this year is 94.4 % of the total against 85.4 % last year on the same date. The acquisition of cotton on the spot market by co-operatives in the South, aided by the banks, particularly the local banks, and by the Federal Farm Board continues with a view to removing from the market until the end of the present

## Cotton.

COUNTRIES	AREA					PRODUCTION							
	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32 1930/31	Aver. 1931	1931/32	1930/31	Aver. 1925/26 to 1929/30	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32 1930/31	Aver. 1931
	1,000 acres					1,000 bales of 478 lbs.							
	= 100					= 100							
Bulgaria . . . .	13	13	11	97.0	120.4	23	18	15	5	4	3	130.8	161.1
Italy . . . . .	2	9	9	26.8	26.9	4	21	16	1	4	3	17.7	23.8
*U. S. S. R. . . .	5,281	3,870	1,974	136.4	267.5	...	7,403	5,030	...	1,549	1,052	...	...
United States . .	40,495	45,091	44,882	89.8	90.2	80,868	66,595	72,983	16,918	13,932	15,268	121.4	110.8
Mexico . . . . .	319	300	472	81.8	67.7	989	848	1,208	207	178	253	116.6	81.9
Total North Am.	40,814	45,481	45,354	89.7	90.0	81,857	67,443	74,191	17,125	14,110	15,521	121.4	110.3
China . . . . .	5,238	5,893	4,474	92.0	117.1	8,839	11,742	9,100	1,849	2,456	1,904	75.3	97.1
*Korea . . . . .	461	463	405	90.6	93.0	...	726	658	...	152	138	...	...
India . . . . .	22,358	23,014	24,377	97.1	91.7	16,884	20,032	21,548	3,428	4,191	4,508	81.8	76.0
Syria & Lebanon	76	60	55	126.3	130.9	81	59	47	17	12	10	137.3	171.6
Total Asia . . .	27,672	28,767	28,900	96.2	95.7	25,304	31,833	30,695	5,294	6,659	6,432	79.5	82.4
Algeria . . . . .	3	10	15	31.4	21.2	4	25	28	1	5	6	17.0	15.0
Egypt . . . . .	1,747	2,162	1,828	80.8	95.6	6,146	8,005	7,588	1,286	1,675	1,587	76.8	81.0
Eritrea . . . . .	6	7	7	89.3	92.6	9	8	8	2	2	2	121.1	120.8
Uganda . . . . .	876	739	615	118.6	142.4	800	744	620	170	156	130	106.8	128.0
It. Somaliland .	10	10	16	51.8	60.6	17	17	20	4	3	4	103.7	84.4
*Ang.-Egyp. Sud.	366	387	274	91.9	129.9	...	509	602	...	106	126	...	...
*Tanganyika . . .	—	—	—	—	—	56	98	98	12	19	21	60.3	56.8
Total Africa . .	2,642	2,937	2,181	90.0	106.5	6,976	8,799	8,264	1,463	1,841	1,729	79.2	84.3
Grand Totals . .	71,143	77,207	76,764	92.1	92.7	114,164	108,114	113,181	23,888	22,618	23,678	105.6	100.9

\* Countries not included in the totals.

season about 7 million bales unless prices do not rise meanwhile to 12 ½ cents a lb. Middling, that is about double the present price. The operation has been conducted on a large scale and leads to the expectation that there will be a determined attempt in the future to see that the sowings next season are reduced to about half those of the current season, it being apparently impossible to reach this result by uniform legislative action throughout the Southern States. Political and financial factors continue to have a very great influence on the market, on which the reports on production, despite their clear character, seem to have had almost no effect. Thus, prices, which almost steadily improved, with light oscillations, from November onwards and reached a maximum on 8 December, began once more to fall in sympathy with the prices of silver and cereals. After 15 December cotton prices somewhat improved and from the end of the year

maintained a fairly constant level. The purchases on the part of Japan and China have shown a marked increase in comparison with last year, being respectively about twice and three times as much. In the case of Japan it is expected that there will be a decline after the abandonment of the gold standard. In China the smallness of the cotton crop, due to the decrease in seed supplies and to the floods, is the main factor.

On 21 December the Government of India published the first estimate for the season for all India. While area has decreased only 3 % from that of last season, production shows a fall of 18.2 %, thus confirming the damaging effects of the bad weather conditions and of insect attacks. The smallness of the crop and its bad quality together with the relative smallness of stocks, which are decreasing, has stimulated a rise in prices, due also to the customs protection introduced three months ago. At present the prices of Indian cotton approximate closely to those of American and in consequence the export of Indian cotton has been reduced by about half.

The second estimate, published by the Egyptian Government on 7 December, shows a decline from that of October of about 209,000 centals (44,000 bales) and is 23.2 % below the production of last year. But this decrease, already discounted (see Crop Report for November) has not influenced the market, which has remained prevalently quiet. Analysis of the second official estimate shows that there has been a decrease in all qualities; Sakellaridis has decreased by 1,347,000 centals (282,000 bales) to 1,300,000 centals (270,000 bales); other long staple cottons have fallen from 525,000 (110,000) to 505,000 (106,000); medium and short staple varieties from 4,482,000 (938,000) to 4,341,000 (908,000). Production is thus rather low and, if account is taken of the fact that the production of the next season will be still smaller owing to the reduction by decree, it may be expected that there will be a large reduction in the stocks, that burden the market. Prices, however, owing to heavy sales by growers, do not show signs of rising and those of Uppers, especially of Ashmuni, have fallen almost to the level of American, when account is taken of the exchange difference. The Government has sold about 496,000 centals (104,000 bales) to two local spinners, for consignment over a period of three years. This transaction will tend to restrict the import of manufactured products and favour local labour.

From the first estimate of area cultivated in the Anglo-Egyptian Sudan this season it appears that there has been a decrease of about 8 % from that of last season. Picking is proceeding slowly.

I. S.

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*U. S. S. R.* : According to the data presented to the Central Executive Committee of the Union when it met at the end of December to lay down the economic programme for 1932, the area sown to cotton in 1931 was 5,281,000 acres, 10 % less than the figure previously announced (5,825,000). Sowings were earlier in 1931 than in the previous year but the subsequent work (hoeing, etc.) could not be carried out in good time. Yield of fibre was, according to the results up to 1 December 1931, 32.3 % against 30.7 % in the previous year, an increase due principally to the better quality of seed and improvement in methods of ginning. Cotton acquisitions in the current season are slower than last season. The acquisitions for the year, 90 % of which should have been completed by 1 December 1931 according to the plan, had reached only 65.4 % on 1 January 1932. In the Central Asian republics, the most important centres of cotton production, 62.9 % of the plan had been carried out against 76.1 % on the corresponding date last year, 1 January. According to this year's plan the area under cotton in 1932 should be 6,022,000 acres.

*Argentina* : The cotton season is backward. During November, in the Chaco, which is the principal producing region of the Republic, planting and re-planting continued. The crop has been damaged by locusts. It is anticipated that the area planted to cotton this year will not be smaller than that of last year.

*United States* : Production of cottonseed in 1931 was 150,460,000 centals (7,523,000 short tons) or 21.6 % larger than in the previous year (123,700,000 centals or 6,185,000 short tons) and 10.9 % above the average of the preceding five years 1925-29 (135,664,000 centals or 6,783,000 short tons).

*Mexico* : The month of November was not in general very favourable for preparation of the soil and sowing. Only in the Vera Cruz region have sowings been effected under good conditions. It is forecast that the area sown to cotton this year will be smaller than that of last year.

*India* : In the Central Provinces the weather during December was clear and cool with occasional clouds and a few light showers in some districts. In the second week of the month cotton was slightly damaged by cloudy weather in parts of Nimar. In the Punjab December weather was dry ; at the end of the month the condition of cotton was below the average to average owing to damage by bollworm. According to a telegram of January 13 cotton picking in the Punjab had been generally below the normal. In Madras moderate to heavy rain fell during December in parts of the Carnatic, the central districts and the South of the Presidency ; at the end of the month the condition of standing crops was fair.

*Algeria* : Harvesting of cotton has been completed under rather unfavourable conditions ; yields have been good in the East but in the West boll worm and particularly pink boll worm considerably reduced the crop. Low prices are bringing about the almost complete abandonment of this crop and it is estimated that the area which has fallen from an average for 1926-27 to 1929-30 of 14,200 acres to 3,200 in the present season, will barely exceed 1,100 in the coming season due to commence in March ; percentages : 34.6 and 7.9.

*Egypt* : An order issued by the Ministry of Agriculture on December 23, 1931 fixes the quantity of seed, duly controlled, necessary for the sowing of Sakellaridis cotton in 1932 at 669,000 centals (33,000 short tons).

Cotton ginned from 1 September to end of December, in centals and in bales of 478 lbs. net weight :

		1931	1930	1929	1928
Sakellaridis . . . . .	(centals)	815,950	1,070,680	1,485,070	1,756,490
	(bales)	170,700	224,000	310,680	367,470
Other varieties . . . . .	(centals)	3,439,670	3,535,360	3,655,270	3,941,210
	(bales)	719,600	739,620	764,700	824,520
Total lint . . . . .	(centals)	4,255,600	4,606,040	5,140,340	5,697,700
	(bales)	890,300	963,610	1,075,380	1,191,990
Scarto (linters) . . . . .	(centals)	110,778	107,910	116,450	156,650
	(bales)	23,195	22,580	24,360	32,650

The corresponding figures as on end of November 1931 were respectively as follows : 580,940 centals (121,540 bales) ; 2,685,810 (561,880) ; 3,266,750 (683,420) ; 81,720 (17,100).

*Uganda*. The persistence and exceptional abundance of the rains has not lacked injurious effects on the crops having given rise in many areas to the dropping of flowers and bolls. As a result the crop forecasts have been considerably reduced (see general table). If, however, dry weather sets in a normal manner, a good final crop in February or March may still be hoped for as the last flowering was fairly abundant.

*Anglo-Egyptian Sudan* : The quantity of cotton harvested up to the end of November 1931 expressed in terms of ginned cotton amounted to 30,000 centals (6,200 bales) compared with 38,000 (7,900) in 1930, 32,000 (6,700) in 1929, 33,000 (7,000) in 1928 and 21,000 (4,400) in 1927.

## FLAX

There are now available data of area cultivated last year in fifteen European countries out of twenty-one cultivating flax (excluding the U. S. S. R.). The six countries for which data are still lacking (Spain, France, Great Britain and Northern Ireland, the Irish Free State, Sweden and Yugoslavia) cultivated in 1930 only a little over one-tenth of the total area devoted to flax in Europe and amongst them only France and Yugoslavia are important producers. As regards France it is known that the area has considerably decreased in 1931 in comparison with that in 1930.

The countries for which data are available may be divided into three groups. The first, composed of Poland, Lithuania, Latvia and Estonia, includes the most important areas and in 1930 accounted for about two-thirds of the European crop. The second group is composed of Bulgaria, Hungary and Rumania, which, though in 1930 they represented only 8 % of the total European area under flax, are the only European countries that have in 1931 increased the area under the crop. Finally, in the third group, are the other European countries, amongst which the most important are Belgium, the Netherlands and Czechoslovakia. Assembling the data for each of these groups, the following areas are obtained for 1931, 1930 and the mean of 1925-29.

### *Area under Flax.*

	1931	1930	Mean 1925-29
	(thousand acres).		
1st group . . . . .	539	702	741
2nd " . . . . .	116	82	57
3rd " . . . . .	126	213	269
Total. . . . .	781	997	1,067

In all, the reduction in area in 1931 in relation to 1930 and to the quinquennial mean has been 22 % and 27 % respectively ; practically the same percentages hold good for the first group (23 % and 27 %) while for the third group the reduction has been more considerable (41 % and 53 %) ; in the second group, on the other hand, which

in 1931 had an area under flax only slightly below that of the third group, there has been an increase of 42 % as compared with the area in 1930 and of 104 % as compared with that of the quinquennial mean. It is difficult at the present time to determine whether this increase is part of a permanent trend in the countries in question towards expansion of flax cultivation or is, on the contrary, only a temporary adaptation to present conditions, which induce small cultivators to meet their needs in manufactured textiles by means of domestic industry.

For production the data are limited to ten countries, which in 1930, however, cultivated only 77 % of the area under flax in Europe and accounted for only 61 % of the production. In these ten countries (Austria, Belgium, Bulgaria, Estonia, Italy, Latvia, Lithuania, the Netherlands, Poland and Czechoslovakia), with a reduction of area amounting to 25 % of the area in 1930 and to 31 % of the quinquennial mean, there has been a more marked decrease in production, amounting with respect to the same periods to 32 % and 47 %.

*Flax (Fibre).*

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Average = 100							1930 = 100	Average = 100
1,000 acres				1,000 centals				1,000 pounds					
*Germany . . .	16	27	49	59.8	33.4	(1) 117	—	—	1) 11,634	—	—	—	—
Austria †) . .	8	8	(2) 11	90.3	70.2	109	127	(2) 152	10,935	12,694	(2) 15,225	86.1	71.8
Belgium . . .	36	56	59	63.6	60.5	192	325	580	19,156	32,499	57,950	58.9	33.1
Bulgaria . . .	2	1	1	238.9	299.2	2	2	1	176	230	147	73.6	119.8
Estonia . . .	45	80	89	56.3	50.8	131	237	221	13,056	23,745	22,084	55.0	50.1
*Finland (3) . .	10	14	12	72.7	81.9	...	35	31	...	3,527	3,098	...	...
*Northern Irel.	7	29	33	26.1	22.4	...	120	132	...	12,032	13,761	...	...
*Hungary †) . .	44	36	7	123.0	—	...	869	—	...	86,913	—	...	...
Italy . . .	12	13	18	96.5	69.6	50	56	56	5,000	5,573	5,639	89.7	88.7
Latvia (3) . .	104	128	163	81.1	63.7	311	424	437	31,129	42,395	43,714	73.4	63.9
Lithuania (3) .	139	204	211	67.8	65.6	466	642	802	46,628	64,188	80,199	72.6	58.1
Netherlands . .	16	37	37	43.2	43.2	82	230	253	8,234	22,957	25,346	35.9	32.5
Poland . . .	253	285	280	88.7	90.6	720	973	1,243	71,981	97,300	124,345	74.0	57.9
*Rumania . . .	60	44	50	157.5	135.9	...	59	55	...	5,933	5,511	...	...
Czechoslov. . .	23	31	52	72.7	44.1	83	128	238	8,344	12,816	23,764	65.1	35.1
*U. S. S. R. (4)	5,733	4,278	3,271	134.0	175.3	...	9,449	7,064	...	944,904	706,425	...	...
Total . . .	638	843	921	74.6	69.0	2,059	3,042	3,911	205,891	304,251	391,233	67.7	52.5

\* Countries not included in the totals. — †) Production expressed in terms of dried flax straw. — (1) Private estimate. — (2) Average 1927 to 1929. — (3) Flax and hemp. — (4) Dolgunetz quality.

It is very probable that when the figures of area and production are known for all the European countries, these percentages will not be much changed.

Instead of a large reduction of flax growing in the European countries, there has taken place a large increase in the U. S. S. R., where it has been extended on a large scale to new areas such as those of the Urals and Siberia. The increase in area in 1931 compared with 1930 notably exceeds the total area destined to flax in all of the European countries. It is interesting to note that, according to the program of national economy established at the session of last December of the Central Executive Committee, the area destined to flax for fibre (Dolgunetz) in 1932 should exceed that of 1931 by about one-fifth and reach 6,326,000 acres.

As regards the production of the U. S. S. R. in 1931, there is still a lack of more or less reliable information. An indication may be furnished, however, by the fact that the programme of national economy for 1932 proposes an increase during the present year of the yield of flax for fibre (Dolgunetz) to 2.3 centals per acre. It is consequently very probable that this yield was not obtained in 1931. It is, moreover, known that the average yield for the five-year period 1925-1929 was 2.1 centals per acre and that the same yield was obtained in 1930, for which year the final figures are not yet known (it may be useful to recollect that during the pre-war period 1909-1913, the average yield was about 3.6 centals). Admitting the probability of a yield of 2.1 centals in 1931 also — although in the Baltic countries the yield in 1931 was slightly below that of 1930 — it may be calculated that the production of the Soviet Union amounted to about 12.1 million centals, consequently attaining a maximum for the post-war period, and that it also exceeded the average of the five-year period 1909-1913, calculated at 11,310,000 centals.

As regards the total world production, since the production of the European countries can hardly have exceeded 3,300,000 centals it may be placed at about 15½ million centals; it would therefore be the largest obtained in the post-war period but below the 1909-13 average, which was 16,300,000 centals. It is interesting to note that the share of the U. S. S. R. in the world production of flax, which was 70 % during the five-year period 1909-13, increased in 1931 to 80 %.

With respect to the world market, it is not easy to foresee what effects the increase in the production of the U. S. S. R. will have on its exports owing to the constant increase of home consumption.

The flax market remained quiet until nearly the beginning of December. In December, prices rose slightly but still remained a little lower than those of the previous year and were nearly the same as in 1913.

I. G.

\* \* \*

*Great Britain and Northern Ireland* : This year's crop in Northern Ireland is mostly of good quality but the yield varies from satisfactory to rather less than average.

1931

*Argentina* : Weather conditions during the harvesting period this season have not been very favourable, progress being interrupted by frequent rains. In the province of Buenos Aires important damage has been caused by insects (isoca). In Entre Rios rains have favoured the spreading of the disease and delayed cutting. The product obtained is not uniform nor of high quality. Next year it will be necessary to pay closer attention cleaning the fields and to crop rotation.

(Telegram of 19 January) : The reports of a rather unsatisfactory linseed crop are confirmed.



*Linseed.*

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Avg. 1925 to 1929	% 1931 1931/32	1931	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	1931
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 =100	Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 =100	Aver.
	1,000 acres					1,000 centals			1,000 bush. of 56 pounds				
*Germany. . .	16	27	49	59.8	33.4	(1) 73	—	—	(1) 180	—	—	—	—
Austria . . .	5	5	8	90.9	59.8	18	19	27	32	34	49	94.1	65.8
Belgium . . .	36	56	59	63.6	60.5	127	233	237	227	417	512	54.4	44.3
Bulgaria . . .	2	1	1	238.9	299.2	11	3	2	19	5	3	408.4	504.7
Estonia . . .	45	80	80	50.3	50.8	141	279	222	253	499	396	50.6	63.7
Italy . . .	21	24	44	88.5	48.0	113	125	206	202	224	368	90.4	54.9
Latvia (2) . .	104	128	163	81.1	63.7	326	410	452	582	733	808	79.4	72.0
Lithuan. (2) .	139	204	211	67.8	65.6	562	858	824	1,003	1,532	1,471	65.5	68.2
Poland . . .	253	285	280	88.7	90.6	1,102	1,308	1,467	1,968	2,335	2,620	84.3	75.1
Czechoslov. .	23	31	52	72.7	44.1	72	94	202	128	169	361	75.7	35.3
<i>Total Europe</i>	<i>628</i>	<i>814</i>	<i>907</i>	<i>76.2</i>	<i>69.1</i>	<i>2,472</i>	<i>3,329</i>	<i>3,689</i>	<i>4,414</i>	<i>5,948</i>	<i>6,588</i>	<i>74.2</i>	<i>67.0</i>
*U.S.S.R. . . .	7,735	5,553	4,267	139.8	181.8	...	...	13,255	...	...	23,670	...	...
Canada . . .	627	582	563	107.8	111.3	1,436	2,830	2,553	2,565	5,069	4,558	50.6	56.3
United States	2,313	3,732	2,909	62.0	79.5	6,170	11,894	11,586	11,018	21,240	20,689	51.9	53.3
India . . . .	3,020	2,802	3,392	107.8	89.0	8,467	8,512	8,848	15,120	15,200	15,800	99.5	95.7
*Eritrea . . .	2	—	10	—	31.2	9	—	38	16	—	68	—	23.1
French Mor. .	67	58	48	116.1	140.3	411	251	229	734	448	408	164.0	179.9
Argentina . .	(3) 8,640	(3) 7,511	(3) 6,916	115.0	124.9	46,297	39,348	41,099	82,674	70,265	73,391	117.7	112.6
*Uruguay. . .	520	402	204	129.3	255.1	...	2,575	1,254	...	4,599	2,240	...	...
<b>Grand Total</b>	<b>15,295</b>	<b>15,499</b>	<b>14,735</b>	<b>98.6</b>	<b>103.8</b>	<b>65,253</b>	<b>66,173</b>	<b>68,003</b>	<b>116,525</b>	<b>118,170</b>	<b>121,434</b>	<b>98.6</b>	<b>96.0</b>

\* Countries not included in the total. — (1) Private estimate. — (2) Flax and hemp. — (3) Area sown.

*India* : In Bihar and Orissa the weather in the first half of December was dry ; in the latter half of the month light rains fell in some districts and at the end of the month crops were in good condition. In the United Provinces there was an absence of rain and at the end of the month crops were doing well and prospects were favourable.

According to the first report on linseed the area sown for 1931-32 is 2,377,000 acres compared with 2,177,000 in 1930-31 and 2,582,000 on the average for 1925-26 to 1929-30 ; percentages : 109.2 and 92.1 respectively.

*Palestine* : In the Northern areas ploughing and sowing of linseed is in progress. An increased area is being sown with this crop. In Southern Palestine the area under linseed is mainly confined to demonstration plots planted with seed issued from the experimental stations. An increased interest is being taken in the growing of linseed which is more remunerative than wheat or barley.

## HEMP

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver- age = 100				1930 = 100	Aver- age = 100
1,000 acres			1,000 pounds							
<i>Fibre.</i>										
Germany (1) . . . .	1	1	4	80.4	19.5	—	—	—	—	—
Austria . . . . .	1	1 (2)	1	80.4	89.9	(3) 1,801	(3) 1,789	(3) 1,770	72.7	73.5
Bulgaria . . . . .	9	9	10	102.6	94.8	4,189	3,299	3,028	127.0	138.3
Italy . . . . .	160	214	236	74.8	67.9	125,959	201,400	222,033	62.5	56.7
Poland . . . . .	76	79	74	97.0	102.8	31,769	46,103	42,655	68.9	74.5
Rumania . . . . .	120	83	101	145.3	118.9	...	37,323	36,741	...	...
Czechoslovakia . . .	21	15	26	134.0	78.7	10,888	8,959	16,436	121.5	66.2
U. S. S. R. . . . .	2,277	1,854	2,268	122.8	100.4	...	...	695,913	...	...
Syria and Lebanon	6	6	6	96.4	94.5	2,954	3,576	3,761	82.6	78.6
Totals . . .	273	324	353	84.6	76.9	176,019	263,693	288,267	66.6	60.9

## Fibre.

## Hempseed.

Austria . . . . .	(4)	(4)	1	82.9	61.5	154	198	266	78.0	58.1
Bulgaria . . . . .	9	9	10	102.6	94.8	3,668	2,324	2,525	157.9	145.3
Italy . . . . .	160	214	236	74.8	67.9	7,542	10,875	13,563	69.3	55.6
Poland . . . . .	76	79	74	97.0	102.8	47,091	48,340	44,176	97.4	106.6
Czechoslovakia . . .	21	15	26	134.0	78.7	8,020	6,840	11,776	126.5	68.1
U. S. S. R. . . . .	2,277	1,854	2,268	122.8	100.4	...	...	1,229,963	...	...
Totals . . . . .	266	317	347	84.4	77.1	66,475	68,077	72,306	97.7	92.4

\* Countries not included in the totals. — (1) Hemp and other textile plants. — (2) Average 1927 to 1929 — (3) Dried fibre. — (4) Area under 500 acres.

## SERICULTURE

COUNTRIES	QUANTITIES OF EGGS PREPARED FOR INCUBATION					PRODUCTION OF COCOONS				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930	Aver.				1930	Aver.
1,000 ounces						1,500 pounds				
Bulgaria . . . . .	20	44	40	45.8	50.4	2,646	4,995	4,388	53.0	60.3
Italy . . . . .	701	946	993	74.1	70.6	75,968	116,259	109,297	65.3	69.5
Korea. . . . . s)	222	225	185	98.6	120.2	27,605	23,404	19,953	97.2	138.4
Japon . . . . . { s)	2,807	2,790	2,560	100.6	109.6	435,419	463,325	386,033	93.9	112.8
{ t)	2,985	3,339	3,537	87.9	83.0	332,562	416,356	371,904	79.9	59.4
Syria and Lebanon.	81	106	96	76.7	84.6	6,206	8,047	6,844	77.1	90.7
Total . . .	6,766	7,450	7,411	98.8	91.3	880,406	1,037,886	898,319	84.8	98.0

s) Spring cocoons. — t) Summer-autumn cocoons.

*Indo-China* : In Tonkin and Annam the rearings have suffered owing to the heat and storms. In Cambodia the rearings were good.

The growth of mulberry trees, which in Tonkin and Annam was prejudiced by drought, has made a good recovery except in Central and South Annam. In Cochin-China production of leaves continues to be abundant.

## TOBACCO

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver. = 100				1930 = 100	Aver. = 100
1,000 acres					1,000 pounds					
*Germany. . . . .	26	23	21	112.1	119.8	...	46,409	44,112	...	...
Belgium. . . . .	7	7	7	100.0	97.2	12,739	15,387	15,334	82.8	88.1
Bulgaria. . . . .	77	79	83	96.7	92.7	54,784	59,395	60,580	92.2	90.4
*Greece. . . . .	...	195	221	...	...	98,787	152,660	137,965	64.7	71.6
*Rumania. . . . .	40	85	77	46.8	51.6	...	53,012	42,445	...	...
Czechoslovakia . .	22	18	14	125.7	157.4	27,778	22,095	16,842	125.7	170.0
*U. S. S. R. . . . .	406	248	210	164.0	193.6	—	—	—	—	—
*Canada. . . . .	...	41	37	...	...	48,280	36,717	34,774	131.4	133.7
United States . . .	2,020	2,101	1,776	96.1	113.7	1,610,098	1,635,210	1,359,631	98.5	118.4
Japan . . . . .	91	89	91	102.7	100.8	155,757	145,175	142,157	107.3	109.6
Syria and Lebanon .	21	10	7	207.9	278.4	12,002	6,900	4,969	173.7	243.8
Algeria . . . . .	40	57	65	68.9	60.6	20,283	43,486	54,233	46.6	37.4
*Tripolitania . . . .	1	1	—	88.2	—	1,323	1,543 (r)	243	85.7	545.0
Totals . . .	2,278	2,361	2,043	96.4	111.4	1,893,531	1,927,708	1,653,236	98.2	114.5

\* Countries not included in the total. — (r) Average 1927 and 1928.

*United States* : The weather in the last week of December was helpful for handling tobacco in Kentucky while stripping continued in some other localities.

The December estimates of area and production in 1931 of the chief types of tobacco grown are given in the following table together with the corresponding figures for 1929 and 1930 :

Classification	Area (000 acres)			% 1931 1930 = 100	Production (000 lbs)			% 1931 1930 = 100
	1931	1930	1929		1931	1930	1929	
Flue-cured. . . . .	974.7	1,128.0	1,087.7	86.4	657,715	864,276	749,752	76.1
Fire-cured. . . . .	243.7	234.0	222.6	104.1	197,267	167,108	187,291	118.1
Air-cured, light. . . .	566.8	505.7	455.0	112.1	496,495	363,922	366,963	136.4
Air-cured, dark. . . .	82.7	78.2	78.0	105.8	71,657	61,025	61,421	117.4
Cigar filler. . . . .	74.3	72.7	70.2	102.2	91,857	73,271	78,561	125.4
Cigar binder. . . . .	67.5	70.9	61.4	95.2	84,873	93,471	81,223	90.8
Cigar wrapper. . . . .	8.7	10.8	12.6	80.6	8,794	11,502	14,903	76.5
Miscellaneous. . . . .	1.2	0.8	1.8	150.0	1,440	640	2,804	225.0
Total. . . . .	2,019.6	2,101.1	1,987.3	96.1	1,610,098	1,635,210	1,537,193	98.5

Production in 1931 was about 1.5 % smaller than the record crop of 1930 but about 4.7 % larger than the 1929 crop. Area and production of the important flue-cured types were greatly reduced, the decrease being partly offset by increases for other types, especially light air-cured (Burley).

*Algeria* : As the tobacco crop, which is not very abundant but of good quality, has been sold at satisfactory prices, it is considered that sowings will be larger in the present season, especially as cotton growing shows a marked decline.

Some sowings have been destroyed by frost.

## HOPS

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Average = 100				1930 = 100	Average = 100
	1,000 acres					1,000 pounds				
*Germany . . . . .	25	32	36	79.6	70.5	...	24,366	16,111	...	...
Belgium. . . . .	3	3	3	100.0	73.9	2,271	2,961	5,118	76.7	44.4
France. . . . .	8	8	11	...	...	13,318	6,487	10,798	205.3	123.3
England and Wales. . .	20	20	25	97.7	79.6	18,928	23,336	34,563	66.8	54.8
Czechoslovakia. . . .	30	38	36	79.6	85.2	24,725	32,464	21,520	76.2	114.9
*U. S. S. R. . . . .	3	—	(1)	—	29.1	1,764	—	—	—	—
United States . . . .	21	19	23	109.7	92.0	25,852	23,447	31,378	110.3	82.4
Totals. . . (\$)	82	88	98	94.3	86.8	85,094	93,695	103,377	90.8	82.1

\* Countries not included in the totals. — (\$) For the few countries for which figures are still lacking, the data of the area in 1930 have been utilised. — (1) Year 1927.

## OTHER PRODUCTS

### Cacao.

*Dutch Guiana* : The area of cacao plantations continues to decrease.

*Gold Coast* : Throughout the cacao areas weather has been favourable for harvesting and preparation. Harvesting proceeded rapidly and by the middle of December three-quarters of the major crop had already been picked. Purity continues high, slate being the most prominent defect. The maintenance of this level of purity is dependent to a large extent on the degree of drying given to the early part of the crop, which has not yet been shipped.

During the first two weeks of December prices up-country were steadier than during the earlier part of the season and farmers were selling freely. Movement toward the ports from up-country centres was not so rapid as marketing at these centres and there was a fair amount of cacao in the up-country stores. Exports remained low, the total from the beginning of the season until mid-December being the lowest recorded for eight years. The tonnage arriving by rail at Takoradi in the same period, however, has seldom been larger and stocks at the port at the middle of December were the highest since the harbour was opened.

Crop movement has been as follows :

	First half December 1931	Novem. 1931	First half December 1930	1 Oct. to mid-Dec. 1931	1 Oct. to mid-Dec. 1930
Arrivals by rail at Takoradi and Accra (1,000 lb.) . . . . .	36,051	55,642	19,746	103,345	59,080
Shipments from all ports (1,000 lb.) . .	28,885	42,224	...	84,000	...
Stocks at end of period (1,000 lb.) . .	49,094	32,411	11,993	—	—

## Coffee.

*Guatemala* : Weather has not been favourable, the excessive rains of winter having caused damage.

*Dutch Guiana* : It is estimated that production in 1931 was smaller than in 1930 but prospects for 1932 are good.

*Indo-China* : In Annam the arabica crop in the Centre promises to be good.

*Réunion* : Nearly three-quarters of the coffee crop has been destroyed by drought. The drop in prices is giving rise to fears that a large part of the crop will be abandoned in certain parts of the island despite the export bonus.

## Groundnuts.

*Argentina* : Sowing has been effected under good conditions. Germination has been regular. A good crop is forecast.

*United States* : Area and production of groundnuts in 1931 was as follows. The total production includes groundnuts gathered and also those grazed and otherwise utilised :

	1931	1930	Average 1925-29	1931 1930 = 100	% Aver. = 100
	—	—	—	—	—
	(thousand acres).				
Groundnuts (total). . . . .	2,172	1,862	1,719	116.6	126.4
Groundnuts (gathered) . . .	1,419	1,133	1,103	125.2	128.7
	(thousand cents).				
Groundnuts (total). . . . .	15,544	11,767	11,703	132.1	132.8
Groundnuts (gathered) . . .	10,831	7,471	8,013	145.0	135.2

Total production of groundnuts in 1931 was about 32 % larger than that of 1930 and the average. A larger proportion than usual of the 1931 production was gathered. Large increases were recorded in the production of large-podded varieties in the Virginia-North Carolina area and in the crop of Spanish and runner varieties in the Southeast and Southwest.

*Indo-China* : The crop yield in Tonkin was from 10 to 13 cents per acre, or considerably larger than those of previous years which hardly exceeded 9 cents.

## Rapeseed, Sesamum and Mustard.

*Germany* : The final estimates for colza and rapeseed are as follows : Area : 24,822 acres against 32,100 in 1930 and 49,600 on the average of the three years 1927-29 (77.4 % and 50.0 %). Production : 281,900 cents (563,700 bushels) against 383,700 (767,400) and 609,300 (1,219,000).

*Austria* : On January 1 the crop condition of winter colza was 2.5 as on December 1, 1931 compared with 2.6 on January 1, 1931.

*Rumania* : The area sown to winter colza up to December 1, 1931 was 69,000 acres compared with 66,000 and 42,000 sown up to the same date of 1930 and 1929 ; percentages : 104.9 and 164.7.

*India* : In Bihar and Orissa at the end of December crops were in good condition. The weather during December was dry in Bengal and at the end of the month prospects were favourable. In the Punjab dry weather also prevailed and condition varied from average to good.

According to the first report, the area sown to rapeseed and mustard for 1931-32 is 3,209,000 acres compared with 3,241,000 in 1930-31 and 3,181,000 on the average for the previous five seasons ; percentages : 99.0 and 100.9.

The final estimate of the sesame area is 5,223,000 acres compared with 5,318,000 in 1930 and 5,256,000 on the average for 1935-29 ; percentages : 98.2 and 99.4 ; that of production is 9,274,000 centals (464,000 short tons) against 10,438,000 (522,000) and 9,654,000 (483,000) respectively ; percentages : 88.8 and 96.1.

*Indo-China* : In Annam the crop was normal.

### Jute.

*Indo-China* : In Annam crop yields were average.

## FODDER CROPS

*Germany* : The definitive estimates of area and production of the principal fodder crops are as follows :

	1931	1930	Average 1925-29	% 1931 = 100	Average = 100
	<i>Area (thousand ares).</i>				
Mangolds . . . . .	1,933	1,824	1,777	106.0	108.8
Turnips . . . . .	656	648	632 *	101.2	103.8
Clover . . . . .	4,275	4,365	4,494	97.9	95.1
Alfalfa . . . . .	756	740	684	102.2	110.7
Irrigated meadows. . . . .	996	960	923	103.7	107.9
Non-irrigated meadows. . . . .	12,603	12,636	12,645	99.7	99.7
	<i>Production.</i>				
Mangolds (ooo cent.)	657,545	670,256	524,997	98.1	125.2
(ooo sh. tons)	32,877	33,512	26,249		
Turnips (ooo cent.)	184,010	165,927	158,046	110.9	116.4
(ooo sh. tons)	9,200	8,286	7,902		
Clover (ooo cent.)	206,428	213,296	191,430	96.8	107.8
(ooo sh. tons)	10,321	10,665	9,571		
Alfalfa (ooo cent.)	46,920	45,663	35,483	102.8	132.2
(ooo sh. tons)	2,346	2,283	1,774		
Irrigated meadows (ooo cent.)	47,610	46,838	39,578	101.6	120.3
(ooo sh. tons)	2,380	2,342	1,979		
Non-irrigated meadows (ooo cent.)	515,079	509,635	454,677	101.1	113.3
(ooo sh. tons)	25,754	25,481	22,734		

(\*) 1927-1929.

*Austria* : On January 1 the condition of fodder crops was as follows : red clover 2.7 (2.6 on December 1 and 2.4 on January 1, 1931) ; alfalfa 2.7 (2.8, 2.9) ; mixed clover 2.6 (2.5, 2.5) ; mixed fodder and vetches 2.7 (2.8, 2.5) ; permanent meadows 2.6 (2.6, 2.4) and pastures 2.8 (3.1, 2.8).

*Belgium* : Thanks to the mild December weather the clover fields and pastures continued to grow until very late in the season, furnishing an additional supply of feed.

For the manuring of meadows basic slag is preferred to other phosphates owing to its lower price ; due to the economic situation, however, lower prices are awaited before purchasing fertilisers.

Lining of meadows is progressing.

*Great Britain and Northern Ireland* : The mild open weather in December favoured root crops. In England and Wales the swede harvest was practically completed and, though mostly small, the quality of the roots was fairly good. In Scotland turnips and swedes that had been left in the fields increased in bulk during the month.

*Italy* : The situation of autumn-winter catch crops which have already been utilised for feeding livestock, is fairly good. Growth of crops on irrigated fields is normal.

*Lithuania* : According to a recent communication production of clover in 1931 was 28,248,000 centals (1,412,000 short tons) against 35,489,000 (1,774,000) in 1930 (79.6%) ; the corresponding figures for hay from permanent meadows are 30,094,000 (1,505,000) and 36,554,000 (1,828,000).

*Canada* : According to the revised estimates the area of fodder corn in 1931 was 342,000 acres compared with 426,000 in 1930 and 473,000, the average of 1925-29; percentages: 80.2 and 72.3. Production was 57,300,000 centals (2,865,000 short tons) against 69,514,000 (3,476,000) and 78,871,000 (3,944,000) respectively ; percentages: 82.4 and 72.7.

*United States* : Because of the persistently warm weather, pastures and ranges at the end of December remained green in most sections from the Great Plains eastward. Ranges were open in many parts of the Rocky Mountain area. In the South-west pastures and ranges vary from fair to excellent.

Hay production in 1931 was very small ; that of tame hay was the smallest since 1913 if the slightly smaller crop of 1930 is excepted ; the wild hay crop was one of the smallest on record due largely to the drought, which was particularly severe in the

northern Great Plains States, where much of the wild hay acreage is located. The latest figures are as follows:

		1931	1930	Average 1925-29	% 1931	
		—	—	—	1930 = 100	Av. = 100
<i>Area (thousand acres).</i>						
Tame hay . . . . .		53,449	52,622	58,123	101.6	92.0
Wild hay . . . . .		11,977	13,793	13,802	86.8	86.8
<i>Production.</i>						
Tame hay	(ooo centals)	1,284,660	1,269,260	1,788,164	101.2	71.8
	(ooo sh. tons)	64,233	63,463	89,408		
Alfalfa	(ooo centals)	418,280	457,420	563,024	91.4	74.3
	(ooo sh. tons)	20,914	22,871	28,151		
All timothy and clover	(ooo centals)	551,880	551,400	847,608	100.1	65.1
	(ooo sh. tons)	27,594	27,570	42,380		
Wild hay	(ooo centals)	162,660	215,020	254,908	75.6	63.8
	(ooo sh. tons)	8,133	10,751	12,745		

From these figures it may be noted that production of tame hay is about 29 % below the average although acreage was only 8 % below. In the case of wild hay production was below the average by about 36 % and acreage by 13 %.

In the following summary are given the December estimates of production of hay seeds in 1931 compared with the corresponding figures for 1930 and the average of 1925-1929:

		1931	1930	Average 1925-29	% 1931	
		—	—	—	1930 = 100	Av. = 100
<i>Area (in thousand acres)</i>						
Clover seed (red and Alsike) . . . . .		885	1,076	991	82.3	89.3
Timothy seed . . . . .		483	428	538	112.8	89.7
Alfalfa seed. . . . .		354	420	288	84.2	122.8
Sweet clover seed . . . . .		218	219	264	99.9	82.6
Lespedeza seed . . . . .		56	42	44	135.5	129.4
<i>Production.</i>						
Clover seed (red and Alsike)	(ooo centals)	733	914	853	80.2	86.0
	(ooo bushels)	1,222	1,523	1,421		
Timothy seed	(ooo centals)	921	783	909	117.6	101.2
	(ooo bushels)	2,046	1,740	2,021		
Alfalfa seed	(ooo centals)	512	687	532	74.4	96.2
	(ooo bushels)	853	1,145	886		
Sweet clover seed	(ooo centals)	456	509	660	89.6	69.1
	(ooo bushels)	760	848	1,100		
Lespedeza seed	(ooo centals)	60	32	54	186.1	110.8
	(ooo bushels)	238	128	215		



The figures show large decreases in both area and production of red and Alsike clover seed and alfalfa seed compared with 1930 ; production of sweet clover seed was about 10 % smaller although area remained practically the same. Timothy and les-pedeza seed showed large increases in both area and production. For both clover seed and sweet clover seed, production was much below the average.

*Algeria* : Growth of the pastures is at a standstill but pasture grass is on the whole sufficient.

*Egypt* : Weather conditions during December were favourable to sowing, germination and growth of *berسيم* (clover). Sowing of late-sown areas is over. Germination and growth are satisfactory. The first cutting is being taken from early-sown areas and some of the normal cultivations. In Assiut province the second cutting was commenced in early-sown areas. Crop condition on 1 January was 100, the same as on 1 December and on 1 January 1931.

*French Morocco* : At the end of December pastures were dried up and gave only poor feed but the rains in the last days of the year improved the situation.

## LIVESTOCK AND DERIVATIVES

### Condition of livestock and dairy production.

*Belgium* : Livestock are in satisfactory health. Fodder production is sufficient and permits maintenance at a minimum of expense.

*Irish Free State* : The weather during the greater part of December was mild and open and pastures continued to support a reasonable amount of keep for most of the month. Farmers were thus under no necessity of touching their reserves of roots or other fodder and adequate supplies of these remained at the end of the month.

Milk yields showed the usual seasonal decline.

*France* : Due to the advent of severe cold weather livestock have been stabled. Fodder reserves are abundant although sometimes of mediocre quality ; livestock are in satisfactory condition but prices remain low.

*Great Britain and Northern Ireland* : In England and Wales it was not necessary to draw heavily on winter keep in December and the outlook in this respect continued satisfactory. In Scotland, while the turnip crop is below average in weight, dry fodder is plentiful and supplies of concentrated foods sufficient ; prices of feeding-stuffs have fluctuated more than usual. In Northern Ireland the mild weather and abundance of pasture for the season enabled cattle to maintain condition. Pastures, though more abundant than usual in December, depreciated in quality but most home-grown feeding-stuffs were abundant. Milk yields in England and Wales improved somewhat in December as compared with November, while in Scotland they were well maintained for the season and in Northern Ireland were normal.

*Hungary* : Fodder supplies will suffice for livestock if they are distributed economically.

Livestock are in satisfactory health except in some regions ravaged by pig disease.

*Argentina* : Production of fodder crops is abundant. The condition of livestock is showing considerable and continued improvement thanks to the abundance of pasture grass.

*United States* : Milk production per cow on December 1, 1931 was about the same as on that date last year but about 3 % below the production reported on November 1 and 3 % above the average December production per cow during the previous five years. As the number of milk cows is increasing in nearly all parts of the country, total milk production on the first of the month is believed to have been 3-4 % above production on that date last year. In most parts of the country the percentage of cows being milked averages slightly higher than has previously been reported and the number of cows being culled from the herds is the lowest for some years past.

Due to the mild weather in the last week of December livestock continued to graze in most sections from the Great Plains eastward. They are holding up well in the Rocky Mountain area with only variable feeding necessary, due to the open range in many parts.

*Algeria* : Health is satisfactory. The bad weather has hindered pasturing and, as fodder reserves are insufficient, feeding leaves much to be desired and condition is declining rapidly. The fall in prices, accentuated by numerous sales by natives for ready money, seriously aggravates the situation of stockrearsers.

*French Morocco* : As pastures provided insufficient feed, stock were in danger at the end of December.

*Réunion* : Despite the drought the livestock situation is good. The season's breeding results nearly suffice to restore former livestock numbers.

*Union of South Africa* : Thanks to the very general and soaking rains in November grazing and stock recovered rapidly. In the Western Province, though veld had dried off, it was good for the time of year and stock were generally fat and healthy. In the north-west Cape exceptional heat was experienced and the weather was very dry ; veld was poor in certain districts and trekking for fresh pasturage and water was necessary. In the Natal highveld also very little rain had fallen and condition of veld and stock was still bad. In Bechuanaland, however, excellent rains had fallen and extensive ploughing was possible ; grazing and stock were rapidly improving in condition.

The wool clip had almost finished by the end of November but in many cases the wool was still on the farms or unsold at the coast. Some serious losses amongst sheep were caused by drowning, hail and exposure. The blow-fly is again making its appearance in the Eastern Province and the southern Free State and is a serious menace in certain districts.

*New Zealand* : For the first three months of the current season, August-October, grading figures for butter show production to be ahead of the corresponding period of 1930 by 7.2 %, while cheese appears to be catching up on last year's record, though still 17.7 % in arrears. The total butter-fat production for the period is 3.1 % below the first three months of 1930-31 October especially witnessed a great stimulation in output of both butter and cheese, that of the former being 8.8 % ahead of October 1930 while the latter reached a level only 5.3 % below the figure attained in the same month. The apparent stagnation in cheese production in the first two months of the season was due in part to the longer period now required for maturing.

# Numbers of Pigs in Germany on 1 December 1931.

The fall in pig prices since the end of 1929, broken only by seasonal fluctuations, was in time bound to result in a decline in the pig population. The enumeration in December has in fact shown a marked falling off from the figures of September, as against the expansion, even if not a large one, experienced in the corresponding period of 1930 and of 1929. Nevertheless the total for 1 December remains rather larger than on 1 December 1930 and considerably higher than at the same date in 1929 and 1928.

## Numbers of pigs in Germany (1).

CLASSIFICATION BY SEX AND AGE	1 Dec. 1931	1 Sept. 1931	1 June 1931	2 March 1931	1 Dec. 1930	1 Sept. 1930	2 June 1930	1 March 1930	2 Dec. 1929	2 Sept. 1929	1 June 1929	1 Dec. 1928
(1000 head).												
Totals . . . . .	23,781	25,348	22,529	21,790	23,142	23,423	19,805	18,649	19,944	19,604	16,795	20,106
Sucking pigs under 8 weeks of age . . . . .	5,125	6,804	6,027	5,750	5,469	6,522	5,091	5,012	4,417	5,373	4,160	4,003
Young pigs from 8 weeks to 6 months of age . . . . .	10,409	10,980	10,351	10,231	10,035	9,809	9,178	8,555	8,693	8,290	8,099	8,487
Pigs from 6 months to 1 year of age . . . . .	5,774	5,391	4,172	3,939	5,481	5,125	3,842	3,437	4,599	4,238	3,060	5,129
Of which :												
Boars for service . . . . .	52	51	54	58	61	57	57	54	56	50	48	53
Sows for breeding (total) . . . . .	495	509	603	706	674	812	876	722	663	652	671	556
Sows covered . . . . .	(251)	(276)	(409)	(425)	(369)	(442)	(574)	(455)	(383)	(363)	(405)	(312)
Other swine . . . . .	5,226	4,771	3,425	3,176	4,749	4,256	2,909	2,712	3,880	3,585	2,841	4,520
Pigs, 1 year old and over . . . . .	2,414	2,173	1,979	1,870	2,455	1,967	1,694	1,695	2,235	1,653	1,475	2,487
Of which :												
Boars for service . . . . .	64	73	71	62	60	61	57	51	50	58	55	52
Sows for breeding (total) . . . . .	1,458	1,661	1,663	1,517	1,503	1,467	1,356	1,229	1,179	1,208	1,145	1,063
Sows covered . . . . .	(861)	(902)	(1,021)	(927)	(942)	(861)	(915)	(792)	(775)	(737)	(787)	—
Other swine . . . . .	893	439	246	291	892	440	280	315	1,006	387	275	1,372

(1) Present territory, excluding the Saar.

Up to the enumeration of last September, when a maximum was attained, the quarterly figures showed only to a limited extent signs of a restriction in pig-rearing though on the basis of the price-development over a long period a retrograde tendency was to be expected. The large surplus of potatoes from the very good crop of 1930 doubtless operated in maintaining numbers. To this may be added the increased proportion of young animals and the fact that their smaller average weight at slaughter involves for the production of a given quantity of meat the maintenance of a relatively large number of animals. The progressively increasing proportion of young animals is apparent from the following figures.

## Percentage classification of pigs by age.

	1 December 1931	1 December 1930	2 December 1929	1 December 1928
Sucking pigs under 8 weeks of age . . . . .	21.6	23.3	22.1	19.9
Young pigs from 8 weeks to 6 months of age . . . . .	44.0	42.8	43.6	42.2
Pigs from 6 months to 1 year of age . . . . .	24.3	23.4	23.1	25.5
Pigs 1 year old and over . . . . .	10.1	10.	11.2	12.4

It is apparent that the number of pigs over one year old has continually diminished in the last three years. The proportion of sucking pigs under eight weeks (21.6 %) in the last enumeration is relatively small and indicates the tendency to reduce the pig population. The increase in proportion of young animals and the economic orientation toward earlier slaughtering of porkers is particularly clear from the following table.

*Percentage classification according to age of pigs over 6 months old  
not destined for reproduction.*

	1 December 1931	1 December 1930	2 December 1929	1 December 1928
Pigs from 6 months to 1 year of age . . . . .	85.4	84.2	79.4	70.7
Pigs 1 year old and over . . . . .	14.6	15.8	20.6	23.3

The last four December enumerations make it plain that the rearing of pigs of over one year, apart from those for breeding, has not only continually but markedly fallen off.

To form an opinion on the future development of the pig population it is above all important to follow the changes in the numbers of brood sows and sows in farrow. The increase (+) or decrease (—) with reference to the numbers at the same date in the previous year is given as a percentage.

According to the enumeration of	Brood sows (total)	Sows in farrow
2 June 1930 . . . . .	+ 22.9	+ 24.9
1 September 1930 . . . . .	+ 22.5	+ 18.4
1 December 1930 . . . . .	+ 17.8	+ 12.9
2 March 1931 . . . . .	+ 13.9	+ 8.4
1 June 1931 . . . . .	+ 5.5	— 3.9
1 September 1931 . . . . .	— 2.2	— 9.6
1 December 1931 . . . . .	— 10.3	— 15.2

The regular change from one enumeration to another in the foregoing data is especially significant. The decline in the rate of increase of sows in farrow as well as in brood sows on 1 September 1930 and onward may be taken as a clear sign of the coming decrease in the pig population fully seen only a year later. The decline in the rate of increase was first transformed into a decline in absolute numbers in the case of sows in farrow in June 1931. The last decreases (—10.3 and —15.2 respectively on 1 December 1931) indicate a decline in total pig population more marked than the usual seasonal fluctuation, even if the average remains on the whole above that of preceding years on account of the process of rationalisation indicated.

### **Livestock in Austria.**

The general census of industrial and agricultural-forestry farms of 14 June 1930 included a count of livestock belonging to agricultural-forestry farms.

The figures established previous to 1930 and referring to the numbers of livestock in Austria (present territory) are derived from two sources: a) Farm census (1902) and b) livestock census (1923, 1920, 1910).

Strictly speaking, the figures for 1930 are comparable only with those for 1902 because they have been obtained by the same method. Although the two censuses do not coincide exactly in scope (in fact the small gardens and similar farms of less than 5 ares which were included in the 1902 census were excluded from that of 1930) their results may however be compared especially for cattle as the two censuses were effected in the same month. Excluding Burgenland, it is found that from 1902 to 1930 the numbers of the following four kinds have increased: horses by 4.7 %, pigs by 21.3 %, goats by 12.2 %, fowls by 47.0 % and geese by 8.6 %. The total numbers of cattle and of sheep on the contrary show decreases compared with 1902 of 1.4 % and 37.1 % respectively. It may be observed however that the number of cows has increased by 18.4 % whereas that of oxen has decreased by 35.7 % compared with 1902 as a result of the development of the milk industry.

*Head of livestock in Austria.*

Classification	Farm census			Livestock census			
	In the whole of the Republic 14 June 1930	Exclusive of Burgenland		In the whole of the Republic 7 March 1923	Exclusive of Burgenland		
		14 June 1930	3 June 1902		7 March 1923	31 December 1920	31 December 1910
Horses . . . . .	247,724	227,798	634	232,651	264,884	235,523	298,025
Mules and asses . . . . .	2,171	2,061	...	1,400	1,349	—	1,841
Cattle . . . . .	2,312,531	2,180,933	2,210,820	1,162,346	2,037,502	2,190,433	2,218,763
of which: Calves under 1 year . . . . .	434,005	407,320	...	398,826	372,020	533,437	376,180
Bulls over 1 year . . . . .	78,765	74,948	...	68,143	65,335	75,470	75,138
Heifers over 1 year . . . . .	332,778	310,008	...	323,410	305,677	313,664	305,653
Cows . . . . .	1,207,083	1,136,416	1,028,042	1,074,864	1,006,299	979,820	1,105,491
Bullocks . . . . .	250,840	252,237	302,247	302,103	286,180	288,042	356,312
Sheep . . . . .	272,228	269,743	428,710	597,413	591,120	450,491	266,028
Goats . . . . .	198,813	192,092	172,027	332,146	374,051	319,711	233,973
Pigs . . . . .	1,965,380	1,829,126	1,507,971	1,473,112	1,380,475	1,246,663	1,810,338
Poultry . . . . .	6,438,327	5,777,973	...	5,908,992	5,417,710	—	—
of which: Fowls . . . . .	5,945,419	5,373,924	3,656,873	5,707,310	5,242,156	—	—
Geese . . . . .	232,937	214,534	197,501	114,813	93,539	—	—
Ducks . . . . .	185,780	167,193	...	75,503	71,510	—	—
Turkeys and Guinea fowls . . . . .	24,191	22,822	...	11,360	10,505	—	—
Beehives . . . . .	290,978	275,024	...	252,675	238,944	—	—

The figures for 1930 are not absolutely comparable with those for 1923, 1920 and 1910 due to the difference in date and to the difference in scope of the two censuses. Theoretically, it might be expected that, given an identical date, higher figures would be obtained from a general census of livestock than from a census of livestock on farms. In fact, the farm census of 1930 for example excluded very small holdings and there certainly exist some livestock also on non-agricultural holdings. A decrease in numbers compared with 1923 may therefore be to a large extent the result of diversity of methods but, as for some kinds the figures for 1930 are higher — taking into account the difference in date — there is reason to believe that there has actually been an increase.

This applies on the one hand to cattle, the numbers of which were 2,180,933 in 1930 compared with 2,037,502 in 1923 and on the other to pigs 1,829,126 against 1,380,475 (excluding Burgenland). For these two kinds, despite the difference in methods of

estimating and in date, it may be stated with a high degree of certainty, that an increase actually took place from 1923 to 1930. Owing to the large range of seasonal variations the same conclusions cannot be arrived at for poultry.

### Number of pigs in Netherlands on 1 December 1931

*Netherlands* : Equating to 100 the number of pigs on June 1, 1930 the following percentages are obtained for September 1, December 1, 1930, March 1, June 1, September 1, and December 1, 1931.

	Dec. 1 1931	Sept. 1 1931	June 1 1931	March 1 1931	Dec. 1 1930	Sept. 1 1930
Sows covered . . . .	88	81	87	96	105	94
Sucking pigs . . . .	92	121	118	121	89	111
Young pigs under						
60 kgs. . . . .	132	136	133	112	114	108
Pigs 60-100 kgs. . . .	135	136	122	118	128	129
Pigs over 100 kgs. . .	138	108	95	106	114	107
Total . . . . .	119	122	117	112	108	110

Although the total number of pigs on December 1, 1931 was higher than that on December 1, 1930 (2,400,000 against 2,180,000), the estimates of December 1, 1931 already show a tendency to reduce the number of pigs. This tendency is indicated by the lower percentage of sows covered.

### LATEST NEWS

*Germany* : The data for livestock, according to the last annual census on 1 December 1931, are, in relation to the corresponding figures for last year, as follows, in million head : Horses 3.45 (3.52) ; cattle 19.09 (18.47), of which milch cows 9.63 (9.45) ; pigs 23.78 (23.44), of which sucking pigs 5.13 (5.47) ; sheep 3.49 (3.50) ; goats 2.51 (2.58) ; geese 5.68 (6.25) ; ducks 3.54 (3.88) ; fowls 84.06 (88.10) ; beehives 1.87 (2.00).

## TRADE

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Wheat. -- (Thousand bushels of 60 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	1,231	73	0	0	4,360	1,337	0	0	5,390	0
Hungary . . . . .	3,358	1,584	0	0	8,910	4,832	0	0	8,745	0
Lithuania . . . . .	0	96	0	0	4	125	0	0	908	0
Rumania . . . . .	5,464	1,503	0	0	29,586	9,634	0	7	14,058	11
U. S. S. R. . . . .	1,760	1,055	0	0	(1) 38,198 (1)	24,361	—	—	112,890	—
Yugoslavia . . . . .	27,451	31,217	7	15	9,351	4,277	0	0	5,412	0
Canada . . . . .	9,520	3,266	1,044	1,809	72,624	106,459	59	37	228,579	182
United States . . . . .	5,058	2,605	—	—	38,098	40,733	5,357	8,502	77,047	19,360
Argentina . . . . .	0	0	0	0	22,663	12,338	—	—	110,253	—
Chile . . . . .	22	99	0	558	0	654	0	0	718	0
India . . . . .	162	70	0	0	224	2,987	208	1,481	3,751	11,144
Turkey . . . . .	0	0	0	0	334	220	0	11	441	11
Algeria . . . . .	208	173	73	48	(1) 1,260 (1)	3,711 (1)	720 (1)	62	9,509	2,285
Tunis . . . . .	4,090	4,615	0	0	2,352	1,896	243	85	6,173	904
Australia . . . . .	0	0	0	0	20,183	15,851	0	0	127,506	0
<i>Importing Countries:</i>										
Germany . . . . .	2,653	85	2,465	1,543	8,580	108	9,105	12,882	441	31,342
Austria . . . . .	0	37	1,433	503	0	136	3,546	2,135	143	8,859
Belgium . . . . .	625	48	4,361	3,680	3,068	154	10,628	18,092	3,405	50,130
Denmark . . . . .	0	4	2,385	485	15	26	7,551	2,002	59	8,128
Spain . . . . .	0	0	55	0	0	4	55	0	7	0
Estonia . . . . .	0	0	22	147	0	0	202	404	0	617
Irish Free State . . . . .	0	0	108	0	(2) 0 (2)	11 (2)	3,751 (2)	3,156	29	10,725
Finland . . . . .	0	0	0	0	0	0	290	0	0	151
France . . . . .	0	0	5,405	4,865	7	1,569	29,545	21,024	1,608	77,675
Gr. Brit. and N. Ir. . . . .	51	73	21,043	19,354	268	408	100,412	73,549	1,139	207,580
Greece . . . . .	0	0	1,878	0	0	0	8,047	7,558	0	23,721
Italy . . . . .	0	7	1,107	8,741	29	37	4,229	28,300	29	83,524
Latvia . . . . .	0	0	77	151	0	0	360	838	0	1,716
Norway . . . . .	0	0	897	577	—	—	1,973	2,318	—	5,210
Netherlands . . . . .	4	26	2,488	2,266	44	66	8,756	10,957	1,139	27,612
Poland . . . . .	59	522	77	4	327	1,330	198	40	3,079	81
Portugal . . . . .	0	0	33	15	—	—	676	136	—	2,194
Sweden . . . . .	0	11	880	533	0	37	1,995	2,491	51	4,799
Switzerland . . . . .	0	0	2,180	1,874	0	0	8,616	7,532	4	18,493
Czechoslovakia . . . . .	0	0	2,528	1,890	4	4	8,477	4,832	7	11,798
Japan . . . . .	—	—	1,207	1,462	—	—	5,585	4,483	—	25,518
Syria and Lebanon . . . . .	0	0	0	0	(2) 459 (2)	118 (2)	0 (2)	15	228	73
Egypt . . . . .	0	0	0	0	(2) 0 (2)	4 (2)	50 (2)	191	4	1,698
Union of South Africa . . . . .	0	0	0	0	(1) 0 (1)	0 (1)	452 (1)	393	0	2,668
New Zealand . . . . .	0	0	0	0	(2) 0 (2)	0 (2)	26 (2)	55	0	213
<b>Totals . . . . .</b>	<b>62,376</b>	<b>47,169</b>	<b>52,245</b>	<b>51,588</b>	<b>261,556</b>	<b>233,972</b>	<b>230,211</b>	<b>213,568</b>	<b>732,798</b>	<b>638,378</b>
<b>Rye. — (Thousand bushels of 56 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	646	319	1,016	118	2,500	1,961	2,413	429	2,165	1,282
Bulgaria . . . . .	181	339	0	0	1,342	854	0	0	2,524	0
Hungary . . . . .	402	433	0	0	1,024	1,020	0	0	2,319	0
Poland . . . . .	240	921	39	0	1,567	6,480	91	0	10,500	4
Rumania . . . . .	547	291	0	0	2,205	830	0	0	2,283	0
U. S. S. R. . . . .	—	—	—	—	(1) 7,874 (1)	3,807	—	—	28,204	—
Canada . . . . .	744	24	0	0	1,441	484	0	0	2,090	0
United States . . . . .	16	0	—	—	43	83	—	—	161	—
Argentina . . . . .	287	63	—	—	642	366	—	—	1,772	—
Turkey . . . . .	83	35	0	0	378	362	0	0	657	0
Algeria . . . . .	—	—	—	—	(1) 8 (1)	24 (1)	0 (1)	0	68	0
<i>Importing Countries:</i>										
Austria . . . . .	0	4	449	224	0	12	929	772	16	3,937
Belgium . . . . .	91	0	331	248	350	20	1,799	1,276	224	6,677
Denmark . . . . .	0	0	882	1,311	0	0	3,870	5,071	8	12,496
Estonia . . . . .	0	0	0	12	0	0	12	67	0	249
Finland . . . . .	0	0	184	795	0	0	486	2,122	4	2,699
France . . . . .	0	0	413	165	0	0	1,114	677	0	2,461
Italy . . . . .	0	0	28	126	0	0	79	429	0	1,067
Latvia . . . . .	0	0	12	16	0	0	89	244	0	465
Lithuania . . . . .	0	12	0	0	0	31	4	0	291	0
Norway . . . . .	0	0	854	559	0	0	2,457	1,688	0	5,397
Netherlands . . . . .	20	16	602	776	264	51	3,398	2,972	1,413	11,261
Sweden . . . . .	0	0	303	113	0	0	689	622	8	929
Switzerland . . . . .	0	0	16	39	0	0	71	142	0	311
Czechoslovakia . . . . .	0	118	1,628	59	4	539	4,888	98	850	1,506
<b>Totals . . . . .</b>	<b>3,257</b>	<b>2,575</b>	<b>6,795</b>	<b>4,566</b>	<b>19,642</b>	<b>16,913</b>	<b>22,335</b>	<b>16,539</b>	<b>56,052</b>	<b>51,113</b>

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Wheat Flour. — (Thousand barrels of 196 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	7	6	6	4	10	55	30	36	65	121
Belgium	3	8	4	12	13	30	16	46	110	118
Bulgaria	31	13	0	0	135	29	0	0	112	0
Spain	2	3	0	0	4	8	0	0	88	0
France	219	283	7	33	1,241	1,039	53	128	3,750	290
Hungary	232	208	0	0	515	1,074	0	0	2,045	0
Italy	109	57	15	10	350	189	49	33	602	115
Latvia	0	4	0	0	0	20	0	0	37	1
Poland	60	42	0	1	144	129	1	4	314	12
Rumania	63	38	0	0	130	116	0	0	225	0
Yugoslavia	8	7	0	0	13	20	0	1	45	1
Canada	477	781	1	1	2,114	2,956	8	10	6,690	25
United States	858	1,156	0	0	2,992	5,126	0	1	17,818	1
Argentina	45	83	—	—	251	340	—	—	1,043	—
Chile	0	4	0	0	3	33	0	0	53	0
India	43	29	0	0	163	165	0	1	526	1
Turkey	0	4	0	2	0	9	2	2	15	6
Japan	63	157	6	10	408	639	26	64	1,772	108
Algeria	...	...	...	...	(1) 10	(1) 31	(1) 3	(1) 1	136	20
Tunis	2	12	2	0	25	42	3	3	128	6
Australia	513	423	0	0	2,774	1,725	0	0	5,308	0
<i>Importing Countries:</i>										
Austria	0	0	87	133	2	1	178	354	7	1,581
Denmark	0	1	80	89	2	6	276	318	12	802
Estonia	2	0	1	6	4	0	6	24	1	45
Irish Free State	...	...	...	...	(2) 4	(2) 8	(2) 526	(2) 504	20	1,881
Finland	0	0	139	175	0	0	449	634	0	1,097
Gr. Britain and N. Ir.	233	237	558	533	910	868	2,155	2,532	2,351	6,539
Greece	—	—	6	7	—	—	18	42	—	84
Norway	0	0	101	76	1	0	294	318	1	712
Netherlands	3	3	38	199	17	19	172	710	58	1,962
Portugal	—	—	4	7	—	—	39	28	—	111
Sweden	0	0	2	2	0	1	8	19	1	36
Czechoslovakia	0	0	39	406	2	2	199	905	0	1,241
Ceylon	—	—	17	21	—	—	71	80	—	227
Java and Madura	—	—	...	...	—	—	(2) 153	(2) 144	—	523
Indochina	—	—	17	21	—	—	72	80	—	218
Syria and Lebanon	...	...	...	...	(2) 22	(2) 1	(2) 42	(2) 15	11	85
Egypt	...	...	...	...	(2) 0	(2) 0	(2) 363	(2) 433	0	1,317
Union of South Africa	...	...	...	...	(1) 0	(1) 2	(1) 2	(1) 21	6	185
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 28	(2) 28	1	119
<b>Totals</b>	<b>2,993</b>	<b>3,649</b>	<b>1,130</b>	<b>1,748</b>	<b>12,259</b>	<b>14,698</b>	<b>5,242</b>	<b>7,528</b>	<b>37,307</b>	<b>20,049</b>
<b>Barley. — (Thousand bushels of 48 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria	87	253	0	0	689	1,497	0	0	3,380	0
Spain	0	37	0	0	9	147	0	0	317	0
Hungary	9	207	0	0	87	611	0	0	1,208	9
Lithuania	0	0	0	0	0	14	0	0	32	0
Poland	1,323	684	0	0	3,739	3,229	0	0	5,829	0
Rumania	4,588	9,581	0	0	22,713	40,065	0	0	69,672	9
Czechoslovakia	446	1,187	0	0	1,272	4,253	0	0	6,256	9
U. S. S. R.	...	...	—	—	(1) 14,698	(1) 10,936	—	—	48,719	—
Canada	1,130	1,130	0	0	5,397	1,800	—	0	19,250	0
United States	165	877	—	—	2,549	4,414	—	—	10,463	—
Argentina	289	390	—	—	717	2,150	—	—	11,878	—
Chile	5	124	0	0	87	409	0	0	1,116	0
India	5	0	0	0	5	5	0	0	638	5
Syria and Lebanon	...	...	...	...	(2) 446	(2) 308	(2) 96	(2) 0	1,810	14
Turkey	772	0	0	0	2,379	193	0	0	1,236	0
Algeria	...	...	...	...	(1) 257	(1) 799	(1) 1,842	(1) 9	3,008	969
Egypt	...	...	...	...	(2) 0	(2) 5	(2) 225	(2) 46	5	317
Tunis	14	18	400	9	243	303	900	276	459	813
Anstralia	18	96	0	0	207	602	0	0	3,234	0
<i>Importing Countries:</i>										
Germany	9	18	2,090	2,411	14	87	8,557	8,745	129	37,305
Austria	0	0	482	395	0	0	1,814	1,566	0	4,327
Belgium	395	23	2,425	2,285	1,066	96	8,157	7,179	2,241	21,955
Denmark	253	487	340	4,703	423	928	3,739	11,281	2,568	31,265
Estonia	—	—	0	0	—	—	0	28	—	23
Irish Free State	...	...	...	...	(2) 9	(2) 0	(2) 23	(2) 14	41	946
France	5	0	2,861	1,543	18	18	6,830	4,340	46	16,062
Gr. Britain and N. Ir.	5	9	3,922	5,081	9	23	10,315	15,909	142	38,940
Greece	—	—	9	28	—	—	9	73	—	165
Italy	0	0	170	207	0	0	455	533	0	1,621
Latvia	0	0	5	69	0	0	9	170	0	441
Norway	0	0	312	110	0	0	643	519	0	2,246
Netherlands	64	69	2,150	3,780	184	216	8,616	11,947	1,281	80,559
Switzerland	0	0	969	615	0	0	2,159	1,952	0	5,893
Yugoslavia	0	0	5	60	23	18	69	170	60	271
<b>Totals</b>	<b>9,532</b>	<b>15,170</b>	<b>16,158</b>	<b>21,826</b>	<b>37,240</b>	<b>73,226</b>	<b>60,358</b>	<b>64,657</b>	<b>194,918</b>	<b>194,869</b>

(1) (2) See notes page 62.



COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Oats. — (Thousand bushels of 32 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	0	34	21	103	(2)	90	(2)	592	165	689
Irish Free State	...	...	...	...	(2)	234	(2)	386	138	792
Hungary	0	7	0	0		7		28	0	41
Lithuania	0	0	0	0		0		117	0	262
Poland	14	21	0	0		34		234	0	427
Rumania	34	710	0	0		765		2,894	0	5,518
Czechoslovakia	179	303	0	0		489		1,419	14	2,218
U. S. S. R.	...	...	...	...		...		...	...	33,517
Yugoslavia	0	0	0	7		0		0	214	7
Canada	1,447	406	661	48		4,141		1,178	1,005	8,309
United States	641	48	7	21		1,853		193	7	406
Argentina	2,637	3,114	—	—		10,493		11,416	—	45,691
Chile	76	248	0	0		214		2,508	0	6,807
Algeria	...	...	...	...	(1)	28	(1)	172	(1)	310
Tunis	34	186	0	0		365		971	0	1,702
<i>Importing Countries:</i>										
Austria	0	0	503	537		0		1,433	1,715	7
Belgium	0	0	138	1,309		0		1,343	4,637	14
Denmark	34	0	76	303		90		689	820	62
Estonia	0	0	14	21		0		21	83	0
Finland	14	0	0	0		21		0	124	69
France	0	0	232	613		7		21	1,399	2,315
Gr. Brit. and N. Irel.	14	14	1,330	4,079		76		69	9,873	11,223
Italy	0	0	861	1,233		0		0	2,997	3,707
Latvia	0	0	7	0		0		0	21	41
Norway	0	0	34	0		0		0	269	0
Netherlands	21	0	439	1,309		55		48	2,156	3,217
Sweden	7	0	406	289		7		34	1,757	1,040
Switzerland	0	0	1,633	1,454		0		0	4,788	4,368
Australia	7	14	0	0		55		76	0	227
<b>Totals</b>	<b>5,209</b>	<b>5,195</b>	<b>6,552</b>	<b>11,326</b>		<b>18,197</b>		<b>22,218</b>	<b>30,135</b>	<b>34,841</b>
									<b>113,396</b>	<b>112,890</b>

**Maize. — (Thousand bushels of 56 lbs).**

COUNTRIES	TWO MONTHS (November 1-October 31)				TWO MONTHS (November 1-October 31)				TWELVE MONTHS (Nov. 1-October 31)	
	1930-31		1929-30		1930-31		1929-30		1930-31	1929-30
	1930-31	1929-30	1930-31	1929-30	1930-31	1929-30	1930-31	1929-30	1930-31	1929-30
<i>Exporting Countries:</i>										
Bulgaria	83	730	0	0		6,208		7,173	0	—
Hungary	43	91	55	94		429		5,984	4,173	236
Rumania	7,358	3,968	0	0		31,707		50,758	0	4
Yugoslavia	252	1,200	24	4		11,464		21,440	43	59
United States	441	106	43	299		2,386		7,685	929	1,204
Argentina	37,235	18,724	—	—		354,075		172,021	—	—
Brazil	...	...	—	—		31		587	—	—
Java and Madura	...	...	—	—		4,209		3,142	—	—
Indo-China	650	1,327	—	—		4,614		4,177	—	—
Syria and Lebanon	...	...	...	...		283		776	87	63
Egypt	...	...	...	...		8		35	531	59
Union of South Africa	...	...	...	...	(1)	3,901	(1)	16,826	(2)	0
<i>Importing Countries:</i>										
Germany	0	0	1,304	501		0		17,869	29,475	—
Austria	0	0	1,087	571		4		31	11,196	7,700
Belgium	71	39	2,898	2,008		1,705		394	30,491	23,060
Denmark	0	0	2,405	913		0		0	24,176	11,167
Spain	0	0	496	198		0		0	6,547	6,858
Irish Free State	...	...	...	...		47		51	21,507	14,370
Finland	0	0	126	28		0		0	634	244
France	4	16	3,429	4,799		71		83	41,990	30,996
Gr. Brit. and N. Ireland	366	327	13,456	8,657		4,299		3,898	95,146	64,832
Greece	—	—	55	4		—		—	665	331
Italy	0	0	1,603	2,583		12		12	31,156	27,235
Norway	—	—	1,287	429		—		—	7,102	4,778
Netherlands	12	24	6,764	4,693		488		1,118	57,931	41,380
Poland	0	0	24	83		0		8	886	701
Portugal	—	—	139	575		—		—	2,866	2,575
Sweden	—	—	1,043	807		—		—	13,055	4,089
Switzerland	0	0	878	567		4		0	6,449	4,532
Czechoslovakia	0	0	2,614	1,039		4		4	23,420	9,720
Canada	0	0	1,972	1,229		16		8	8,500	13,523
Japan	—	—	276	146		—		—	3,018	2,653
Tunis	0	0	39	8		16		4	531	0
<b>Totals</b>	<b>46,515</b>	<b>26,567</b>	<b>42,136</b>	<b>30,319</b>		<b>426,671</b>		<b>296,155</b>	<b>410,896</b>	<b>301,545</b>

(1) (2) See notes page 62.

COUNTRIES	NOVEMBER				ELEVEN MONTHS (January 1-November 30)				TWELVE MONTHS (Jan. 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
<b>Rice. — (Thousand bushels of 45 lbs).</b>										
<i>Exporting Countries:</i>										
Spain . . . . .	230	549	0	0	1,578	2,454	0	0	2,783	
Italy . . . . .	686	1,823	5	10	5,982	9,269	113	299	10,479	299
United States . . . . .	852	857	34	78	5,722	4,809	647	588	5,810	652
Brazil . . . . .	—	—	—	—	(2)	4,066 (2)	1,754	—	1,876	—
India . . . . .	6,937	5,482	441	15	99,750	124,319	1,494	171	129,414	314
Indo-China . . . . .	2,092	2,528	—	—	42,514	46,193	—	—	48,883	—
Siam . . . . .	4,512	2,009	—	—	49,780	42,073	—	—	45,772	—
Egypt . . . . .	—	—	—	—	(2)	1,837 (2)	1,876 (2)	1,524 (2)	2,680	558
<i>Importing Countries:</i>										
Germany . . . . .	309	225	1,166	789	2,841	3,292	18,141	11,616	3,542	12,228
Austria . . . . .	0	0	289	127	0	0	1,391	1,225	0	1,347
Belgium . . . . .	54	0	142	181	387	20	2,763	2,112	20	2,327
Denmark . . . . .	0	0	29	44	0	0	700	279	0	300
Estonia . . . . .	—	—	5	5	—	—	33	78	—	78
Irish Free State . . . . .	—	—	—	—	(2)	0 (2)	0 (2)	98 (2)	83	0
France . . . . .	196	293	1,083	941	1,960	3,924	13,683	11,552	4,228	12,556
Gr. Brit. and N. Ir. . . . .	69	24	593	382	563	456	5,511	5,193	485	5,698
Greece . . . . .	—	—	103	103	—	—	1,092	1,053	—	1,190
Hungary . . . . .	0	0	108	83	5	15	999	735	20	862
Latvia . . . . .	0	0	5	5	0	15	162	122	15	137
Lithuania . . . . .	—	—	0	5	—	—	44	64	0	60
Norway . . . . .	—	—	34	20	—	—	255	216	—	225
Netherlands . . . . .	421	382	652	289	5,218	4,238	11,287	7,613	4,522	7,917
Poland . . . . .	270	15	15	5	1,200	250	3,758	2,611	279	2,616
Portugal . . . . .	—	—	103	269	—	—	1,249	2,014	—	2,092
Sweden . . . . .	—	—	0	0	—	—	274	358	—	358
Switzerland . . . . .	0	0	142	108	0	0	901	808	0	906
Czechoslovakia . . . . .	0	0	255	137	0	0	2,209	2,018	0	2,175
Yugoslavia . . . . .	0	0	132	142	5	5	1,004	941	5	1,146
Canada . . . . .	0	0	132	108	0	0	1,494	1,190	0	1,298
Chile . . . . .	—	—	20	29	—	—	1,048	1,048	—	1,151
Ceylon . . . . .	0	0	1,646	1,421	39	15	20,806	21,678	20	24,020
Java and Madura . . . . .	—	—	—	—	(2)	510 (2)	201 (2)	11,944 (2)	11,150	260
Japan . . . . .	113	1,264	465	906	9,259	1,906	5,609	8,784	2,783	8,828
Syria and Lebanon . . . . .	—	—	—	—	(2)	0 (2)	5 (2)	583 (2)	529	5
Turkey . . . . .	0	0	29	54	0	0	367	402	0	436
Algeria . . . . .	—	—	—	—	(1)	5 (1)	15 (1)	225 (1)	157	20
Tunis . . . . .	0	0	5	5	0	0	64	44	0	54
Union of S. Africa . . . . .	—	—	—	—	(1)	0 (1)	0 (1)	1,842 (1)	1,012	0
Australia . . . . .	20	10	0	5	314	147	59	157	157	167
New Zealand . . . . .	—	—	—	—	(2)	0 (2)	0 (2)	147 (2)	127	5
<b>Totals . . . . .</b>	<b>16,770</b>	<b>14,961</b>	<b>7,633</b>	<b>6,266</b>	<b>233,035</b>	<b>247,341</b>	<b>113,169</b>	<b>99,043</b>	<b>264,953</b>	<b>107,464</b>
<b>Linseed. — (Thousand bushels of 56 lbs)</b>										
<i>Exporting Countries:</i>										
Estonia . . . . .	0	47	0	0	8	91	0	4	98	4
Lithuania . . . . .	134	220	0	0	394	626	0	0	791	0
Argentina . . . . .	4,083	3,486	—	—	69,769	40,943	—	—	45,475	—
India . . . . .	386	287	0	0	4,071	10,279	0	0	10,456	0
Tunis . . . . .	—	—	—	—	—	—	—	—	16	0
<i>Importing Countries:</i>										
Germany . . . . .	0	0	0	0	8	16	0	0	—	—
Belgium . . . . .	4	0	1,035	760	24	47	12,429	8,866	47	9,275
Denmark . . . . .	98	4	350	303	327	118	6,197	2,516	122	2,992
Spain . . . . .	—	—	28	16	—	—	693	567	—	622
Finland . . . . .	—	—	47	55	—	—	705	736	—	748
France . . . . .	0	0	20	0	0	0	110	130	0	142
Gr. Br. and N. Ire. . . . .	4	0	685	583	23	24	9,511	7,098	23	7,637
Greece . . . . .	0	0	1,252	1,102	8	16	12,661	7,771	16	8,934
Hungary . . . . .	0	0	12	4	0	4	161	110	4	114
Italy . . . . .	12	12	0	0	75	252	4	189	256	189
Latvia . . . . .	0	0	181	291	0	0	2,236	1,890	0	2,092
Norway . . . . .	47	24	16	59	157	260	154	228	421	299
Netherlands . . . . .	—	—	39	0	—	—	457	547	—	658
Poland . . . . .	4	8	992	882	87	252	15,633	9,574	260	10,681
Sweden . . . . .	0	8	0	0	12	55	488	266	55	298
Czechoslovakia . . . . .	—	—	71	71	—	—	1,799	1,362	—	1,425
Yugoslavia . . . . .	0	0	79	67	8	31	953	752	31	793
Canada . . . . .	0	0	16	0	0	4	224	217	4	227
United States . . . . .	—	—	1,232	386	—	—	846	807	1,398	891
Japan . . . . .	—	—	31	8	—	—	14,288	12,444	—	12,606
Australia . . . . .	0	0	39	31	0	0	299	209	—	229
<b>Totals . . . . .</b>	<b>4,772</b>	<b>4,527</b>	<b>6,310</b>	<b>4,596</b>	<b>75,638</b>	<b>50,912</b>	<b>79,859</b>	<b>50,813</b>	<b>59,478</b>	<b>60,520</b>

(1) (2) See notes page 52.

COUNTRIES	NOVEMBER				ELEVEN MONTHS (January 1-November 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
<b>Butter. — (Thousand lbs).</b>										
<i>Exporting Countries:</i>										
Austria . . . . .	271	558	2	2	2,652	3,940	1,561	518	4,112	545
Denmark . . . . .	27,827	27,653	37	40	348,281	343,876	1,473	1,338	372,558	1,389
Estonia . . . . .	2,163	1,792	0	0	30,565	29,390	0	0	31,010	0
Irish Free State . . . . .	...	...	...	...	(2) 39,386	(2) 55,032	(2) 3,258	(2) 2,954	58,815	3,391
Finland . . . . .	2,024	2,430	0	4	35,552	34,928	0	7	37,726	7
France . . . . .	1,142	1,426	633	465	10,121	11,173	40,768	10,737	12,053	12,924
Hungary . . . . .	710	220	0	0	3,587	3,172	117	40	3,430	40
Latvia . . . . .	3,027	2,110	0	9	30,474	38,420	24	46	40,630	49
Lithuania . . . . .	802	869	0	0	18,585	15,404	0	0	18,219	0
Netherlands . . . . .	3,644	0,779	1,462	787	68,584	87,550	6,945	3,805	92,394	4,302
Poland . . . . .	1,479	1,592	0	0	26,930	25,708	31	26	26,714	29
Sweden . . . . .	2,531	4,332	2	0	40,647	54,985	33	18	58,857	18
U. S. S. R. . . . .	...	...	—	—	(3) 18,052	(3) 7,677	—	—	23,197	—
Argentina . . . . .	5,205	6,455	—	—	39,745	48,859	—	—	51,156	—
India . . . . .	42	55	33	42	320	492	315	200	551	282
Syria and Lebanon . . . . .	...	...	...	...	(2) 1,609	(2) 1,753	(2) 269	(2) 165	2,161	172
Australia . . . . .	23,064	21,431	0	0	184,397	108,067	—	2	126,411	2
New Zealand . . . . .	26,581	22,703	—	—	189,878	188,432	—	—	208,170	—
<i>Importing Countries:</i>										
Germany . . . . .	4	33	10,174	26,131	265	556	200,568	272,230	578	293,560
Belgium . . . . .	104	196	3,929	2,125	2,608	2,425	37,011	19,302	2,648	22,412
Spain . . . . .	9	22	40	42	86	157	82	324	161	328
Gr. Brit. and N. Irel. . . . .	3,003	4,987	60,831	51,668	31,577	16,321	816,180	990,794	21,028	764,782
Greece . . . . .	—	—	238	106	—	1,259	1,830	—	1,420	—
Italy . . . . .	33	40	379	337	1,272	1,748	5,421	2,597	1,843	3,115
Norway . . . . .	66	0	35	146	1,515	231	337	1,477	236	1,530
Switzerland . . . . .	2	2	1,973	1,265	15	37	20,748	10,533	42	18,786
Czechoslovakia . . . . .	141	134	273	33	622	677	3,953	712	694	714
Canada . . . . .	675	110	2	126	10,395	1,089	2,820	38,202	1,179	38,605
United States . . . . .	93	154	184	101	1,870	2,780	1,678	2,374	2,967	2,471
Ceylon . . . . .	—	—	93	46	—	—	573	648	—	723
Java and Madura . . . . .	—	—	...	...	—	—	(2) 7,132	(2) 6,698	—	7,557
Japan . . . . .	—	—	20	26	—	—	207	556	—	611
Algeria . . . . .	...	...	...	...	(1) 46	(1) 80	(1) 3,117	(2) 2,350	82	3,232
Egypt . . . . .	...	...	...	...	(2) 35	(2) 42	(2) 1,817	(2) 2,006	42	2,417
Tunis . . . . .	0	0	77	82	7	13	798	745	13	820
<b>Totals . . . . .</b>	<b>105,542</b>	<b>106,092</b>	<b>93,376</b>	<b>83,583</b>	<b>1,148,744</b>	<b>1,080,032</b>	<b>1,159,071</b>	<b>1,078,532</b>	<b>1,197,677</b>	<b>1,186,332</b>
<b>Cheese. — (Thousand lbs).</b>										
<i>Exporting Countries:</i>										
Denmark . . . . .	628	1,003	51	70	8,708	11,947	562	708	12,626	809
Finland . . . . .	412	693	0	4	5,423	4,422	22	29	4,683	35
Italy . . . . .	7,939	8,569	689	772	81,831	73,815	9,588	11,828	80,076	12,562
Lithuania . . . . .	258	203	0	11	2,341	1,795	0	9	1,960	11
Norway . . . . .	406	187	44	73	2,599	1,246	514	655	1,380	750
Netherlands . . . . .	15,937	15,695	126	126	178,161	192,740	1,217	1,376	208,789	1,510
Poland . . . . .	313	373	55	90	2,778	9,009	717	992	3,267	1,074
Switzerland . . . . .	3,534	4,811	990	357	51,993	61,500	7,322	3,863	66,146	4,251
Czechoslovakia . . . . .	2,000	1,047	273	231	9,670	7,238	3,532	2,857	8,274	2,963
Yugoslavia . . . . .	494	721	20	22	3,953	4,259	227	280	4,588	300
Canada . . . . .	11,021	1,468	154	247	80,894	62,920	1,288	1,860	66,955	1,779
Australia . . . . .	586	884	0	2	5,818	5,825	20	148	7,273	150
New Zealand . . . . .	21,164	20,081	0	0	160,122	173,231	4	4	201,256	7
<i>Importing Countries:</i>										
Germany . . . . .	807	611	10,142	10,432	6,797	4,905	112,053	128,583	5,410	187,459
Austria . . . . .	441	829	333	392	5,836	4,072	5,430	5,320	4,482	5,637
Belgium . . . . .	62	64	4,169	4,098	754	822	46,183	47,377	975	51,108
Spain . . . . .	9	13	203	527	229	190	3,428	5,157	207	5,886
Irish Free State . . . . .	...	...	...	...	(2) 128	(2) 130	(2) 2,262	(2) 1,940	194	2,350
France . . . . .	3,177	3,402	7,445	6,083	30,314	35,803	77,114	58,972	38,921	66,119
Gr. Brit. and N. Irel. . . . .	564	754	25,625	27,520	6,658	8,276	204,448	309,889	8,927	348,592
Greece . . . . .	7	31	456	159	165	271	3,435	2,213	262	2,302
Hungary . . . . .	7	11	4	31	104	84	194	366	98	888
Portugal . . . . .	—	—	68	68	—	—	701	789	—	1,010
Sweden . . . . .	—	—	181	198	—	—	1,510	1,265	—	1,470
United States . . . . .	148	119	6,058	5,042	1,653	1,947	56,798	63,074	2,127	63,313
India . . . . .	2	0	71	154	—	4	780	1,027	7	1,132
Java and Madura . . . . .	—	—	...	...	—	—	(2) 1,862	(2) 1,378	—	1,871
Syria and Lebanon . . . . .	...	...	...	...	(2) 77	(2) 126	(2) 552	(2) 554	192	780
Algeria . . . . .	...	...	...	...	(1) 130	(1) 159	(1) 5,871	(1) 7,573	212	10,897
Egypt . . . . .	...	...	...	...	(2) 53	(2) 57	(2) 6,069	(2) 6,120	60	7,583
Tunis . . . . .	0	4	188	157	24	28	1,718	1,579	23	1,746
<b>Totals . . . . .</b>	<b>69,866</b>	<b>63,412</b>	<b>66,382</b>	<b>56,875</b>	<b>647,222</b>	<b>660,325</b>	<b>644,944</b>	<b>667,560</b>	<b>728,056</b>	<b>739,993</b>

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (Aug. 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Cotton. — (Thousand bales of 478 lbs.)</b>										
<i>Exporting Countries:</i>										
United States . . . .	1,193	1,031	61	4	3,201	3,577	22	15	7,613	113
Argentina . . . . .	7	6	—	—	49	44	—	—	107	—
Brazil . . . . .	—	—	—	—	(2)	23 (2)	18	—	108	—
India . . . . .	114	190	10	12	526	827	51	51	3,113	392
Egypt . . . . .	—	—	—	—	(2)	330 (2)	236 (2)	0 (2)	1,395	0
<i>Importing Countries:</i>										
Germany . . . . .	24	36	164	216	131	132	437	685	357	1,766
Austria . . . . .	0	0	12	10	0	0	35	34	0	98
Belgium . . . . .	6	2	26	22	29	10	105	108	42	358
Denmark . . . . .	—	—	3	4	—	—	8	10	—	32
Spain . . . . .	0	0	42	36	1	1	105	135	5	471
Estonia . . . . .	0	0	1	1	0	0	5	6	0	13
Finland . . . . .	0	0	3	4	0	0	12	13	0	36
France . . . . .	14	9	60	225	47	43	181	583	115	1,703
Gr. Brit. and N. Irel.	5	6	356	285	24	44	698	731	101	2,293
Greece . . . . .	0	0	5	5	0	0	15	14	0	47
Hungary . . . . .	—	—	7	5	—	—	19	21	—	61
Italy . . . . .	0	0	63	91	0	0	205	222	0	799
Latvia . . . . .	0	0	2	2	0	0	6	7	0	13
Norway . . . . .	—	—	1	1	—	—	2	4	—	10
Netherlands . . . .	0	0	20	17	1	0	66	60	1	218
Poland . . . . .	0	0	20	27	2	1	83	126	5	302
Portugal . . . . .	—	—	9	9	—	—	24	22	—	70
Sweden . . . . .	—	—	17	10	—	—	42	34	—	98
Switzerland . . . .	0	0	12	17	1	0	31	42	1	127
Czechoslovakia . . .	3	3	42	52	11	12	141	177	32	495
Yugoslavia . . . . .	—	0	3	2	0	0	13	13	0	39
Canada . . . . .	0	0	33	34	—	—	70	80	—	214
Japan . . . . .	—	—	—	—	(2)	48 (2)	34 (2)	535 (2)	393	2,878
Algeria . . . . .	—	—	—	—	(1)	0 (1)	0 (1)	0	5	1
<b>Totals . . . . .</b>	<b>1,366</b>	<b>1,283</b>	<b>917</b>	<b>1,694</b>	<b>4,424</b>	<b>4,979</b>	<b>2,911</b>	<b>3,586</b>	<b>13,112</b>	<b>12,652</b>

**Wool. — (Thousand lbs.)**

COUNTRIES	THREE MONTHS (September 1-November 30)				TWELVE MONTHS (Sept. 1-August 31)	
	EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1930-31
<i>Exporting Countries:</i>						
Spain . . . . .	337	386	104	183	646	2,163
Irish Free State . . .	—	—	—	—	(2)	2,392 (2)
Hungary . . . . .	300	216	132	205	1,098	1,276 (2)
Argentina . . . . .	a) 15,417	16,612	—	—	33,014	20,452
Chile . . . . .	b) 181	159	—	—	787	—
India . . . . .	3,686	3,144	278	51	434	994
Syria and Lebanon . .	—	—	—	—	9,365	7,939
Algeria . . . . .	—	—	—	—	(2)	811 (2)
Egypt . . . . .	—	—	—	—	(2)	822 (2)
Union of S. Africa . .	a) —	—	—	—	(2)	309 (2)
Australia . . . . .	b) 115,798	117,683	11	13	(1)	1,131 (1)
New Zealand . . . .	a) 7,910	4,209	0	4	(1)	121 (1)
Importing Countries:						
Germany . . . . .	a) 862	1,021	7,059	12,324	4,411	2,227
Austria . . . . .	b) 979	1,142	2,806	2,383	3,585	3,221
Belgium . . . . .	a) 4	26	950	1,332	29	33
Denmark . . . . .	b) 1,160	1,259	7,214	6,784	4,160	3,560
Finland . . . . .	a) 2,538	1,779	470	337	6,550	5,677
France . . . . .	b) 7	0	520	406	29	9
Gr. Brit. and N. Irel.	a) 2	11	260	207	4	18
Greece . . . . .	b) 8,909	4,255	19,066	35,369	15,781	11,310
Italy . . . . .	a) 13,170	14,716	51,297	40,276	46,714	59,126
Norway . . . . .	b) 2	7	137	247	55	132
Netherlands . . . .	a) 97	168	6,429	2,280	315	608
Poland . . . . .	b) 108	225	1,702	1,030	683	796
Sweden . . . . .	a) 71	84	229	115	187	251
Switzerland . . . .	b) 271	146	247	234	606	467
Czechoslovakia . . .	a) 77	40	496	483	143	82
Yugoslavia . . . . .	b) 238	130	1,054	1,570	754	410
Canada . . . . .	—	—	893	1,120	—	3,580
United States . . . .	a) 44	2	381	450	249	7
Japan . . . . .	b) 313	119	2,377	2,008	855	401
Tunis . . . . .	a) 33	2	165	505	49	22
<b>Totals . . . . .</b>	<b>176,544</b>	<b>169,856</b>	<b>111,562</b>	<b>119,374</b>	<b>428,807</b>	<b>432,631</b>

a) = Wool, greasy; b) = Wool, scoured.

(2) See notes page 62.

COUNTRIES	NOVEMBER		FIVE MONTHS (July 1-Nov. 30)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	NOVEMBER		FIVE MONTHS (July 1-Nov. 30)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1931	1930	1930-31		1931	1930	1931	1930	1930-31
<b>Coffee. (Thousand lbs.).</b>						<b>Tea. (Thousand lbs.).</b>					
<b>EXPORTS.</b>						<b>EXPORTS.</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries</i>					
Brazil . . . . .	...	...	(2) 687,051	(2) 688,127	2,316,998	Ceylon . . . . .	17,311	18,686	86,097	92,134	247,397
India . . . . .	384	502	2,754	4,601	23,490	India . . . . .	42,409	46,549	212,143	228,351	347,401
Java and Madura .	...	...	(2) 19,169	(2) 20,615	38,105	Java and Madura .	...	...	(2) 49,487	(2) 42,896	158,936
						Japan . . . . .	1,713	2,240	12,813	13,380	24,315
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	262	112	1,054	245	1,345	Belgium . . . . .	2	7	11	15	31
Belgium . . . . .	1,603	101	4,872	648	5,090	Irish Free State .	...	...	(2) 82	(2) 53	185
France . . . . .	0	0	7	55	60	France . . . . .	4	4	44	18	35
Netherlands . . . .	904	1,413	4,954	8,031	18,243	Gr. Brit. and N. Ir.	8,730	7,203	40,393	38,458	87,052
Portugal . . . . .	95	68	381	276	552	Netherlands . . . .	9	9	55	40	115
Switzerland . . . . .	53	2	282	115	399	United States . . .	40	26	154	234	486
Canada . . . . .	7	7	22	29	55	Syria and Lebanon	...	...	(2) 2	(2) 9	18
United States . . . .	1,133	2,006	6,482	10,070	24,293	Algeria . . . . .	...	...	(1) 4	(1) 2	22
Ceylon . . . . .	2	26	7	220	227	Union of S. Africa .	...	...	(1) 18	(1) 24	66
Syria and Lebanon	...	...	(2) 2	(2) 13	62	Australia . . . . .	31	79	313	481	851
Australia . . . . .	2	4	29	26	53	New Zealand . . . .	...	...	(2) 18	(2) 42	115
<b>Totals . . . . .</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,428,971</b>	<b>Totals . . . . .</b>	<b>70,339</b>	<b>74,902</b>	<b>401,614</b>	<b>416,169</b>	<b>867,015</b>
<b>IMPORTS.</b>						<b>IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries</i>					
Germany . . . . .	23,887	25,754	120,648	144,043	350,362	Germany . . . . .	924	822	4,277	5,604	12,741
Austria . . . . .	1,612	1,715	6,512	8,620	23,288	Austria . . . . .	134	159	498	551	1,409
Belgium . . . . .	9,793	6,182	53,573	42,503	123,457	Belgium . . . . .	53	55	254	258	639
Bulgaria . . . . .	134	154	481	939	1,660	Denmark . . . . .	104	71	531	498	1,296
Denmark . . . . .	5,608	5,031	26,101	24,097	63,224	Spain . . . . .	37	22	119	134	282
Spain . . . . .	4,200	4,907	18,512	30,395	68,738	Estonia . . . . .	11	22	57	68	146
Estonia . . . . .	16	37	191	150	309	Irish Free State . .	...	...	(2) 8,613	(2) 8,329	24,346
Irish Free State . .	...	...	(2) 134	(2) 130	525	Finland . . . . .	60	20	148	112	280
Finland . . . . .	3,062	4,348	16,003	21,830	40,442	France . . . . .	344	311	1,321	1,307	3,536
France . . . . .	37,320	33,484	184,805	105,985	406,581	Gr. Britain and N.	57,069	48,711	250,866	264,456	541,616
Gr. Britain and N.	...	...	...	...	...	Ireland . . . . .	77	77	315	359	644
Ireland . . . . .	2,901	2,875	15,474	15,437	37,858	Greece . . . . .	82	84	331	355	660
Greece . . . . .	1,064	902	6,120	5,318	12,959	Italy . . . . .	37	37	126	115	326
Hungary . . . . .	470	578	2,740	3,073	7,568	Latvia . . . . .	18	13	64	75	168
Italy . . . . .	7,041	8,803	38,319	40,265	98,480	Lithuania . . . . .	18	15	71	77	179
Latvia . . . . .	26	40	108	165	351	Norway . . . . .	40	31	165	161	388
Lithuania . . . . .	31	46	172	212	478	Netherlands . . . .	2,315	2,418	12,500	12,439	32,512
Norway . . . . .	3,741	3,523	16,667	15,232	37,690	Poland . . . . .	854	381	1,764	1,881	4,614
Netherlands . . . .	9,138	8,642	45,799	42,781	100,488	Portugal . . . . .	51	49	276	247	597
Poland . . . . .	1,607	1,426	7,264	7,897	17,589	Rumania . . . . .	...	...	...	...	(4) 938
Portugal . . . . .	946	1,149	4,198	4,374	11,413	Sweden . . . . .	90	73	381	364	928
Rumania . . . . .	...	...	...	...	(4) 8,125	Switzerland . . . .	157	141	758	721	1,731
Sweden . . . . .	18,909	7,857	55,682	42,071	100,829	Czechoslovakia . .	178	168	1,098	736	1,473
Switzerland . . . .	2,696	2,110	12,816	11,319	31,608	Yugoslavia . . . . .	77	84	386	390	828
Czechoslovakia . .	1,726	2,313	15,477	11,116	29,026	Canada . . . . .	3,217	6,175	11,226	20,946	43,147
Yugoslavia . . . . .	1,543	1,587	7,848	5,408	20,862	United States . . .	7,813	7,564	41,207	41,841	87,151
Canada . . . . .	2,573	2,575	11,067	12,068	33,689	Chile . . . . .	313	344	2,612	2,355	5,362
United States . . . .	128,495	127,604	610,006	610,989	1,728,578	Syria and Lebanon	...	...	(2) 133	(2) 126	351
Chile . . . . .	633	617	4,548	4,008	10,516	Turkey . . . . .	130	218	785	877	2,138
Ceylon . . . . .	75	132	2,264	1,437	8,148	Algeria . . . . .	...	...	(1) 531	(1) 805	3,150
Japan . . . . .	412	370	2,072	1,680	4,478	Egypt . . . . .	...	...	(2) 5,633	(2) 3,547	13,616
Syria and Lebanon	...	...	(2) 756	(2) 884	2,732	Tunis . . . . .	236	271	5,029	1,265	2,852
Turkey . . . . .	774	847	4,361	4,709	12,853	Union of S. Africa .	...	...	(1) 8,384	(1) 8,510	13,226
Algeria . . . . .	...	...	(1) 7,106	(1) 7,075	30,827	Australia . . . . .	4,228	3,898	13,735	21,674	46,441
Egypt . . . . .	...	...	(2) 5,243	(2) 5,774	14,548	New Zealand . . . .	...	...	(2) 4,217	(2) 4,244	14,405
Tunis . . . . .	218	324	1,885	1,404	3,036						
Union of S. Africa .	...	...	(2) 9,321	(2) 7,872	31,890						
Australia . . . . .	240	139	1,442	1,230	2,619						
New Zealand . . . .	...	...	(2) 170	(2) 181	480						
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India . . . . .	...	...	...	...	4,090	India . . . . .	985	758	4,127	2,844	6,232
Java and Madura .	...	...	...	...	...	Java and Madura .	...	...	(2) 4,332	(2) 4,938	11,830
<b>Totals . . . . .</b>	<b>268,402</b>	<b>256,434</b>	<b>1,325,326</b>	<b>1,314,248</b>	<b>3,417,606</b>	<b>Totals . . . . .</b>	<b>79,130</b>	<b>73,001</b>	<b>396,010</b>	<b>407,769</b>	<b>882,115</b>

(1) (2) (4) See notes page 62.

COUNTRIES	NOVEMBER		TWO MONTHS (Oct. 1-Nov. 30)		TWELVE MONTHS (Oct. 1- Sept. 30)	COUNTRIES	NOVEMBER		FOUR MONTHS (August 1-Nov. 30)		TWELVE MONTHS (August 1- July 31)
	1931	1930	1931	1930	1930-31		1931	1930	1931	1930	1930-31
<b>Cacao (Thousand lbs.).</b>						<b>Total Wheat and Flour (*).</b> (Thousand bushels of 60 lbs.)					
<i>Exporting Countries:</i>	<b>EXPORTS.</b>					<b>NET EXPORTS a).</b>					
Grenada . . . . .			(2)	179 (2)	254	0,899					
Dominican Republ. . . . .			(2)	1,109 (2)	1,316	61,337					
Brazil . . . . .			(2)	11,008 (2)	12,353	146,469					
Ecuador . . . . .						32,280					
Trinidad . . . . .			(2)	2,974 (2)	1,594	61,569					
Venezuela . . . . .			(2)	1,197 (2)	2,216	42,384					
Ceylon . . . . .	946	836		1,325	1,495	8,300					
Java and Madura . . . . .			(2)	390 (2)	403	3,073					
Cameroon . . . . .						22,340					
Ivory Coast . . . . .						45,248					
Gold Coast . . . . .	42,280	33,669		54,776	58,872	486,815					
Nigeria . . . . .			(2)	3,715 (2)	3,148	113,325					
St. Thomas and Prince Is. . . . .			(2)	3,492 (2)	1,424	27,011					
Togoland . . . . .						13,448					
<i>Importing Countries:</i>						<i>Exporting Countries:</i>					
Germany . . . . .	0	0	0	0	454	Germany . . . . .	191	(5)	(5)	(5)	(5)
Belgium . . . . .	88	71	137	84	809	Bulgaria . . . . .	1,367	132	4,957	1,466	5,879
France . . . . .	0	26	0	73	223	Spain . . . . .	(5)	15	(5)	37	173
Netherlands . . . . .	1,387	1,404	2,727	2,127	10,673	Hungary . . . . .	4,369	2,881	11,153	9,509	17,651
Czechoslovakia . . . . .	0	13	0	13	18	Lithuania . . . . .	4	99	22	140	944
United States . . . . .	1,032	459	1,576	1,281	8,521	Poland . . . . .	243	604	750	1,833	4,310
Australia . . . . .	57	0	88	9	86	Rumania . . . . .	5,739	1,068	30,155	10,130	15,928
<b>Totals . . . . .</b>	<b>45,749</b>	<b>36,478</b>	<b>84,691</b>	<b>86,663</b>	<b>1,094,328</b>	U. S. S. R. . . . .			177 38,198	177 24,361	7 112,890
						Yugoslavia . . . . .	1,793	1,084	9,410	4,383	5,608
						Canada . . . . .	29,516	34,597	81,735	119,253	257,477
						United States . . . . .	12,213	6,695	46,373	54,552	109,156
						Argentina . . . . .	5,853	2,969	23,754	14,356	122,588
						Chile . . . . .	0	18	15	797	944
						British India . . . . .	200	(5)	636	2,223	(5)
						Syria and Lebanon . . . . .			(2) 375	(2) 44	(5)
						Turkey . . . . .	102	81	323	239	470
						Algeria . . . . .			(1) 570	(1) 3,781	7,690
						Tunis . . . . .	195	180	2,201	1,977	5,802
						Anstralia . . . . .	6,323	6,456	32,264	23,365	150,028
						<b>Totals . . . . .</b>	<b>68,177</b>	<b>57,569</b>	<b>282,893</b>	<b>272,446</b>	<b>818,131</b>
<i>Importing Countries:</i>	<b>IMPORTS.</b>					<i>Importing Countries:</i>	<b>NET IMPORTS b).</b>				
Germany . . . . .	14,101	11,623	31,264	28,874	180,001	Germany . . . . .	(6)	1,455	614	12,695	31,147
Austria . . . . .	1,389	805	2,520	1,795	10,662	Austria . . . . .	1,811	1,044	4,310	3,538	16,875
Belgium . . . . .	1,204	1,711	2,568	3,380	25,510	Belgium . . . . .	3,744	3,660	16,571	18,008	46,704
Bulgaria . . . . .	79	33	101	55	774	Denmark . . . . .	2,734	863	8,726	3,340	11,508
Denmark . . . . .	388	454	507	895	7,591	Spain . . . . .	88	(6)	37	(6)	(6)
Spain . . . . .	401	470	1,429	1,508	22,472	Estonia . . . . .	15	173	206	507	808
Estonia . . . . .	26	68	77	108	478	Irish Free State . . . . .			(2) 6,026	(2) 5,306	18,798
Irish Free State . . . . .			(2) 104	(2) 31	1,786	Finland . . . . .	805	764	2,245	2,763	4,927
Finland . . . . .	29	18	77	33	220	France . . . . .	4,479	3,774	24,364	15,487	60,990
France . . . . .	6,971	9,246	15,300	15,708	90,205	Gr. Brit. and N. Ir. . . . .	22,318	20,550	105,567	80,387	224,680
Gr. Brit. and N. Ir. . . . .	10,163	12,452	19,930	26,140	141,747	Greece . . . . .	1,903	1,308	8,124	7,798	24,089
Greece . . . . .	269	245	622	540	2,480	Italy . . . . .	990	8,525	2,892	27,583	81,368
Hungary . . . . .	1,179	379	1,517	701	5,432	Latvia . . . . .	77	132	360	750	1,540
Italy . . . . .	1,084	1,579	2,665	3,380	10,619	Norway . . . . .	1,337	911	3,248	3,704	8,308
Latvia . . . . .	97	159	185	276	1,724	Netherlands . . . . .	2,634	3,123	9,388	13,900	34,783
Lithuania . . . . .	40	80	75	115	708	Portugal . . . . .	51	44	840	257	2,879
Norway . . . . .	701	291	1,067	622	4,705	Sweden . . . . .	897	533	1,661	2,582	4,598
Netherlands . . . . .	5,216	9,509	19,887	18,208	147,201	Switzerland . . . . .	(7) 2,186	(7) 1,674	(7) 8,616	(7) 7,532	(7) 18,480
Poland . . . . .	993	1,124	2,094	2,388	12,313	Czechoslovakia . . . . .	2,701	3,597	9,320	8,763	17,170
Sweden . . . . .	1,391	672	2,011	1,226	9,092	Ceylon . . . . .	73	92	312	886	966
Switzerland . . . . .	401	474	1,228	1,219	23,808	India . . . . .	(6)	331	(6)	(6)	5,104
Czechoslovakia . . . . .	1,305	1,210	2,315	2,355	18,237	Indochina . . . . .	73	92	312	349	961
Yugoslavia . . . . .	55	123	269	234	1,473	Japan . . . . .	1,047	849	3,920	1,980	18,272
Canada . . . . .	1,603	2,174	2,610	2,791	15,371	Java and Madura . . . . .			(2) 665	(2) 628	2,278
United States . . . . .	18,565	14,198	36,826	30,796	406,686	Syria and Lebanon . . . . .			(6)	(6)	169
Australia . . . . .	985	364	2,026	1,074	7,308	Egypt . . . . .			(1) 1,642	(2) 2,072	9,665
New Zealand . . . . .			(2) 126	(2) 161	1,504	Union of South Afr. . . . .			(1) 463	(1) 478	3,250
						New Zealand . . . . .			(2) 147	(1) 176	728
<b>Totals . . . . .</b>	<b>69,214</b>	<b>69,441</b>	<b>143,396</b>	<b>144,613</b>	<b>1,156,102</b>	<b>Totals . . . . .</b>	<b>49,969</b>	<b>53,697</b>	<b>226,594</b>	<b>226,859</b>	<b>649,774</b>

(\* ) Flour reduced to grain on the basis of the coefficient: thousand barrels of flour = 4,355.55 bushels of grain.

(a) Excess of exports over imports. — (b) Excess of imports over exports.

(c) Data up to 30th September. — (2) Data up to 31st October. — (3) Data up to 30th June. — (4) Data up to 31st May. —

(5) See Net Imports. — (6) See Net Exports. — (7) Wheat only.

## STOCKS

STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS

IN GERMANY, ON DECEMBER, 15.

PRODUCTS	% Stocks: total production				% Available saleable quantities: total production			
	Dec. 15, 1931	Nov. 15, 1931	Dec. 15, 1930	Dec. 15, 1929	Dec. 15, 1931	Nov. 15, 1931	Dec. 15, 1930	Dec. 15, 1929
Winter wheat	37.5	47.4	43.7	46.9	30.0	38.3	35.2	37.6
Spring wheat	66.8	74.0	68.5	73.4	54.7	61.7	53.5	59.8
Winter rye	41.0	50.5	53.4	55.1	17.4	22.3	28.5	30.7
Winter barley	26.7	34.6	28.3	40.3	4.2	6.2	3.7	8.0
Spring barley	54.4	66.2	48.1	58.7	32.6	42.0	27.0	37.1
Oats	69.0	78.4	72.9	72.8	16.5	18.7	19.7	26.3
Potatoes	55.7	65.4	58.5	57.9	16.9	19.0	18.0	16.3

Authority: Preisberichtsstelle beim Deutschen Landwirtschaftsrat.

## COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930
	1,000 centals					1,000 bushels				
<b>WHEAT:</b>										
Canadian in Canada	103,570	101,453	91,718	111,010	114,624	172,631	169,083	152,863	185,017	191,130
U. S. in Canada	17,152	17,648	18,976	2,891	4,898	28,536	29,414	31,627	4,819	8,161
U. S. in the United States	130,094	142,259	146,432	119,730	111,091	228,773	237,009	244,054	199,049	185,151
Canad. in the United States	15,127	14,087	7,558	10,360	23,302	25,212	23,479	12,596	32,266	38,837
Total	271,924	275,447	264,684	253,993	253,973	453,205	459,580	441,140	421,751	423,288
<b>RYE:</b>										
Canadian in Canada	6,425	6,333	7,292	7,356	4,693	11,473	12,202	13,021	13,135	8,380
U. S. in Canada	422	498	460	1,193	1,175	754	782	821	2,131	2,098
U. S. in the United States	5,725	5,839	5,811	9,162	7,232	10,223	10,427	10,377	16,861	12,914
Canad. in the United States	978	787	217	274	241	1,746	1,405	388	489	431
Total	13,550	13,897	13,780	17,985	13,341	24,196	24,816	24,607	32,116	23,823
<b>BARLEY:</b>										
Canadian in Canada	4,786	4,624	5,410	14,410	12,718	9,970	9,633	11,270	30,021	26,465
U. S. in Canada	12	12	12	162	458	25	24	24	338	955
U. S. in the United States	2,057	3,419	3,539	6,714	5,796	6,160	7,123	7,378	13,987	12,074
Canad. in the United States	762	312	2	638	1,481	1,587	649	4	1,329	3,086
Total	8,517	8,367	8,963	21,924	20,453	17,742	17,429	18,672	45,676	42,510
<b>OATS: (1)</b>										
Canadian in Canada	5,298	4,616	6,734	5,118	7,219	16,556	14,426	21,044	15,993	22,560
U. S. in Canada	56	159	78	501	1,234	175	496	244	1,567	3,387
U. S. in the United States	5,370	5,812	5,820	9,887	9,462	16,782	18,164	18,189	30,896	29,568
Canad. in the United States	10	10	13	81	224	32	32	41	255	699
Total	10,734	10,597	12,645	15,587	18,139	33,545	33,118	39,518	48,711	56,664
<b>MAIZE:</b>										
U. S. in Canada	515	570	640	305	128	930	1,017	1,148	545	230
of other origin in Canada	1,177	1,280	865	681	1,040	2,102	2,286	1,544	1,216	1,353
U. S. in the United States	7,085	5,487	4,111	9,628	4,608	12,651	9,798	7,341	17,190	8,228
Total	8,777	7,337	5,616	10,613	5,777	15,673	13,101	10,028	19,951	10,216

(1) All oats expressed in bushels of 56 lbs.

## STOCKS IN ENGLAND AND WALES IN FARMERS' HANDS, ON JANUARY, 1ST.

PRODUCTS	% stocks: total production			Estimated stocks in absolute figures					
	January 1st			January 1st					
	1932	1931	1930	1932	1931	1930	1932	1931	1930
				1,000 centals			1,000 bushels (1)		
Wheat . . . . .	56	50	44	11,984	11,804	12,611	10,073	19,824	21,019
Barley . . . . .	38	40	42	6,518	6,563	9,363	13,580	13,673	19,507
Oats . . . . .	55	56	54	15,322	16,845	13,368	47,880	52,640	57,400
Potatoes . . . . .	42	49	58	22,557	30,150	46,866	37,595	50,251	58,325
Hay . . . . .	71	67	61	125,440	118,496	72,912	6,272	5,925	3,646
Straw . . . . .	63	60	58	52,662	52,035	53,939	2,633	2,602	2,697

(1) For hay and straw thousand short tons.

## QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

SPECIFICATION	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat) . .	17,890	21,432	28,093	16,363	16,925	29,816	35,720	38,488	27,272	28,208
Rye . . . . .	1,445	2,443	922	379	216	2,580	4,363	1,646	677	386
Barley . . . . .	1,800	3,652	1,088	4,780	4,340	3,750	7,608	8,517	9,958	9,042
Oats . . . . .	838	1,222	1,178	1,197	518	2,620	3,820	3,680	3,740	1,620
Maize . . . . .	22,262	25,162	26,515	15,350	13,147	39,754	44,931	47,349	27,411	23,477

Authority: *Broomhall's Corn Trade News*

## GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930
	1000 centals					1000 bushels				
WHEAT:										
Grain . . . . .	13,320	16,608	16,416	10,372	9,230	22,200	27,680	27,360	18,121	15,384
Flour as grain . . .	1,008	1,104	960	960	874	1,680	1,840	1,600	1,600	1,450
TOTAL . . . . .	14,328	17,712	17,376	11,332	10,104	23,880	29,520	28,960	19,721	16,834
Barley . . . . .	1,120	1,100	1,140	1,880	1,560	2,338	2,292	2,375	3,917	3,250
Oats . . . . .	448	432	672	1,008	720	1,400	1,350	2,100	3,150	2,250
Maize . . . . .	5,976	3,840	2,784	2,064	3,504	10,671	6,857	4,971	3,686	6,257

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.

## STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	Dec. 1931	Nov. 1931	Oct. 1931	Dec. 1930	Dec. 1929	Dec. 1931	Nov. 1931	Oct. 1931	Dec. 1930	Dec. 1929
	1000 centals					1000 bales (counting round as half bales)				
In consuming establishments . . . . .	7,799	6,895	5,340	8,083	8,924	1,630	1,441	1,116	1,680	1,844
In public storage and at compresses . .	48,888	51,180	45,218	40,834	28,643	10,426	10,696	9,450	8,377	5,915
TOTAL . . . . .	56,687	58,075	50,558	48,917	37,567	12,056	12,137	10,566	10,037	7,759



STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1) . . . .	1,516	1,452	1,772	2,548	3,864	317	304	371	533	808
Alexandria . . . .	5,587	5,521	4,807	5,214	3,223	1,140	1,155	1,006	1,091	674

Authorities: *East Indian Cotton Ass.* and *Bourse de Minet-el-Bussal*.

(1) Stocks held by exporters, dealers and mills.

STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930
	1000 centals					1000 bales (1 bale = 478 lbs.)				
<i>Great Britain:</i>										
American . . . .	2,032	1,459	1,159	2,651	2,146	425	305	243	555	449
Argentine, Brazil- ian, etc. . . . .	206	192	168	210	464	43	40	35	44	97
Peruvian, etc. . .	262	265	278	426	391	55	56	58	89	82
East Indian, etc.	635	527	502	288	177	133	110	105	60	37
Egyptian, Sudan- ese . . . . .	1,300	1,287	1,189	1,432	1,047	274	269	249	290	219
Other (1) . . . .	179	190	191	233	280	37	40	40	49	59
TOTAL . . . .	4,823	3,920	3,437	5,240	4,505	967	820	730	1,096	943
<i>Bremen:</i>										
American . . . .	1,720	1,868	809	2,670	2,525	361	286	169	560	528
Other . . . . .	18	35	50	72	16	4	7	11	15	3
TOTAL . . . .	1,747	1,401	859	2,751	2,541	365	293	180	575	531
<i>Le Havre:</i>										
American . . . .	863	821	815	1,478	1,076	181	172	170	309	225
Other . . . . .	117	119	124	168	134	24	25	26	35	28
TOTAL . . . .	980	940	939	1,646	1,210	205	197	196	344	253
<i>Total Continent (2):</i>										
American . . . .	3,621	2,708	1,939	4,838	4,265	682	565	406	1,012	802
Argentine, Brazil- ian, etc. . . . .	45	57	81	154	59	9	12	17	32	12
E. Indian, Austral- ian, etc. . . . .	95	115	163	213	108	20	24	34	45	23
Egyptian . . . .	142	126	116	121	65	30	26	24	25	14
W. Indian, W. Afri- can, E. African, etc. . . . .	32	36	85	80	101	7	8	7	17	21
TOTAL . . . .	3,575	3,077	2,324	5,406	4,598	748	635	488	1,131	962

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

### IMPORT DUTIES ON CEREALS AND FLOUR, AS

Duties expressed in the official currency of the respective countries per metric quintal (a)  
and in U. S. A. \$ cents per bushel or barrel (U. S. measures) (b).

(M = imports exclusively by the Monopoly).

[illegible]

# RULING IN EUROPE ON JANUARY 1<sup>st</sup> 1932 (*see over*).

GENERAL NOTE: The duties indicated are those generally applied. Reductions into dollars have been made, for countries that on 1st January maintained the gold standard, according to the legal parity (see table on page 84), for other countries according to the exchange rates (see table on page 83) or according to the special rules established for that purpose (see the notes below). In subsequent numbers of the Crop Report all known modifications will be regularly given. (See also page 79).

WHEAT FLOUR		RYE FLOUR		NOTES	COUNTRY
a	b	a	b		
37.50	643.28	12.00	205.85	(1) General duty. — (2) Wheat imported under customs control for the manufacture of wheat starch, as well as hard wheat imported under customs control by mills manufacturing hard wheat groats in 1931 before 1 October, for the manufacture of groats. — (3) In cases where an export certificate (Ausfuhrschein) showing the export of a corresponding quantity of the same cereal during the period ending 31 December 1931 is produced; duty valid until 31 July 1932. — (4) Barley imported under customs control for stock feeding. — (5) As under note 4; in cases of controlled purchase of certain quantities of potato flakes or home grown barley.	Albania
43.17	914.23	43.17	914.23		Germany
15.50	279.10	15.50	279.10	a) indicates basic duty; b) supplementary duty. — (1) In addition <i>ad valorem</i> taxes: 2 % for whole cereals, 7 % for wheat flour, 4 % for rye flour. — (2) General duty. — (3) Barley for stock feeding, recognised as such.	Austria (1)
8.00	144.00	8.00	144.00		
(2) 4.00	(2) 9.95	(3) 4.00	(3) 9.95	(1) In addition <i>ad valorem</i> turnover taxes: 4 % for oats, 2 % for all other cereals and flour mentioned. — (2) Import and transit are conditional on special ministerial authorisation. — (3) Import and transit of these products, when originating in or coming from the U. S. S. R., are conditional on special ministerial authorisation.	Belgium (1)
324	208.08	324	208.08	a) indicates import duty; b) total of taxes, etc. levied on import.	Bulgaria
105	67.42	105	67.42		
—	—	—	—	(1) 25 % of each duty is levied in gold pesetas, 75 % in paper pesetas with a supplement fixed every 10 days. — (2) Import forbidden until price of wheat on the markets of Castile is 53 pesetas per quintal (120.39 \$ c. per bushel).	Denmark
21.00	n, 380.24	9.00	n, 154.39		Spain
(4) 18.00	(4) 423.02	5.00	117.51	(1) All these products are controlled by a monopoly and their import is permitted only on presentation of an import permit and of a certificate or other proof of origin. — (2) General duty; Estonian mills have the right to import free of duty 145 kg. of wheat for each 100 kg. of bolted wheat flour on condition that they import it within a year's time from the export of the wheat flour. — (3) Special duty on imports from Lithuania. — (4) Unbolted flour. — (5) Bolted flour.	Estonia (1)
(5) 29.00	(5) 681.54				
—	—	—	—	(1) Duty cwt.	Irish Free State
(1) 150	(1) 837.08	(1) 145	(1) 825.76	(1) Unbolted flour. — (2) Bolted flour.	Finland
(2) 250	(2) 561.80	(2) 225	(2) 506.54		
(5) 128.00	(5) 445.84	70.00	243.76	(1) In addition, for all the products mentioned, except maize, there is a supplementary <i>ad valorem</i> duty on imports from countries of devaluated currency: 7 % for India, 8 % for Norway, 10 % for Argentina and Uruguay, 15 % for Australia, Denmark, Great Britain, Mexico and Sweden. — (2) All imports of foreign wheat are subject to the presentation to the customs authorities of a nominal and non-transferable import licence, stating the quantity for which it is valid; these conditions do not apply to denatured wheat, not usable for human consumption. — (3) Yellow maize, small grain, Bessarabian type, for feed. — (4) Other maize. — (5) For coefficient of extraction of 70 % and over. — (6) For coefficient of extraction of under 70 % and over 60 %. — (7) For coefficient of extraction of 60 % and under.	France
(6) 180.00	(6) 567.34				
(7) 185.00	(7) 644.31				
—	—	—	—		Great Britain and Northern Ireland

## IMPORT DUTIES ON CEREALS AND FLOUR, AS

COUNTRY	OFFICIAL CURRENCY	WHEAT		RYE		BARLEY		OATS		MAIZE	
		a	b	a	b	a	b	a	b	a	b
Greece a) . . .	gold drachmas	6.00	31.51	5.00	24.51	5.00	21.00	5.00	14.00	(1) 5.00 (2) 6.00 (3) 3.00	(1) 24.51 (2) 29.41 (3) 14.70
b) . . .	"	4.50	23.63	3.75	18.38	3.75	15.75	3.75	10.50	(1) 3.75 (2) 4.50 (3) 2.25	(1) 18.38 (2) 22.06 (3) 11.03
Hungary . . .	gold crowns	(1) 6.30	(1) 34.76	(1) 5.80	(1) 29.85	(1) 5.00	(1) 22.06	(1) 4.80	(1) 14.12	(2) 2.00	(2) 10.29
Italy . . .	liras	75.00	107.44	36.50	48.82	14.70	16.35	11.95	9.13	(1) 75.00 (2) 5.00 (3) 30.00	(1) 100.28 (2) 6.68 (3) 40.09
Latvia (1) . . .	lats	(2) 7.00 (3) 5.60 (4) 1.75	(2) 36.76 (3) 29.41 (4) 9.19	—	—	(5) 12.00	(5) 50.41	(5) 12.00	(5) 33.61	—	—
Lithuania . . .	litas	30.00	81.61	20.00	50.78	20.00	43.52	20.00	29.02	20.00	50.78
Norway . . .	"	M	M	—	—	M	M	M	M	—	—
Netherlands . . .	"	(1) —	(1) —	—	—	—	—	—	—	—	—
Poland (1) a) . . .	zlotys	25.00	76.30	(2) 17.00	(2) 48.42	17.00	41.51	17.00	27.67	(3) — (4) 6.00	(3) — (4) 17.11
b) . . .	"	2.50	7.68	1.70	4.84	1.70	4.15	1.70	2.77	(3) 0.30 (4) 0.60	(3) 0.85 (4) 1.71
Portugal . . .	gold escudos	(1)	(1)	(1)	(1)	2.80	61.17	2.80	40.78	2.00	54.89
Rumania . . .	lei	160	26.05	45	6.86	40	5.21	36	3.14	36	5.49
Sweden . . .	Swed. crowns	(1) 3.70	(1) 19.17	(1) 3.70	(1) 17.89	3.70	15.33	—	—	—	—
Switzerland . . .	Swiss. francs	0.60	3.15	0.60	2.94	(1) 9.45 (2) 0.60	(1) 39.70 (2) 2.52	0.60	1.68	0.50	2.45
Czechoslov. (1) a)	Czech. crowns	30.00	24.21	38.00	28.62	34.00	21.93	36.00	15.49	(2) 18.09 (3) 6.00	(2) 13.53 (3) 4.51
b)	"	25.00	20.17	15.00	11.27	36.00	23.23	30.00	12.91	—	—
c)	"	2.50	2.02	2.20	1.67	2.50	1.60	1.80	0.78	1.50	1.13
Turkey . . . . .	Turk. pap. pounds (1)	6.30	79.03	4.50	52.69	4.00	40.12	4.00	26.75	4.50	52.69
Yugoslavia . . .	gold dinars	(1) 5.00	(1) 26.26	(1) 5.00	(1) 24.51	6.00	25.21	3.00	8.40	2.50	12.25

RULING IN EUROPE ON JANUARY 1<sup>st</sup> 1932 (end).

WHEAT FLOUR		RYE FLOUR		NOTES	COUNTRY
a	b	a	b		
10.70	183.55	(4) 10.00 (5) 12.00	(4) 171.54 (5) 205.85	a) indicates import duty; b) surtax. — (1) Yellow maize. — (2) White maize. — (3) Pignoletto cinquantino. — (4) Flour in bag. — (5) Flour in boxes, etc.	Greece
8.02	137.58	(4) 7.50 (5) 9.00	(4) 128.66 (5) 154.39		
13.00	234.16	12.00	216.14	(1) Cereals for sowing, with special authorisation, free. — (2) Maize for sowing, free.	Hungary
112.35	525.73	50.90	238.10	(1) White maize. — (2) Maize other than white maize, not fit for consumption and destined for industrial use. — (3) Other maize.	Italy
(6) 10.00 (7) 25.00	(6) 171.54 (7) 428.86	(8) 5.00 (9) 12.00	(8) 85.77 (9) 205.85	(1) The import of wheat and of rye, as well as that of flour manufactured from these cereals, is allowed only on presentation of a certificate indicating the purchase of certain quantities of the same cereals of domestic origin. — (2) General minimum duty. — (3) Special duty, for imports from U. S. S. R. — (4) Special duty applying to 50,000 quintals (183,715 bushels) per annum, imported from Lithuania. — (5) During 1932 the import of barley and of oats is limited to 5,000 quintals each (22,965 bush. of barley and 34,447 bush. of oats). — (6) Unbolted flour. — (7) Bolted flour. — (8) Roughly ground. — (9) Flour at least partly bolted.	Latvia
90.00	790.73	55.00	488.72	—	Lithuania
M	M	M	M	—	Norway
(2) —	(2) —	—	—	(1) To cover the expenses of the Organisation for the purchase of home grown wheat at a special price, importers of wheat pay a certain amount per quintal. — (2) The trade in imported flour is regulated by the Central Flour Organisation.	Netherlands
37.00	368.09	25.00	240.25	(1) The import of the products enumerated is prohibited during 1932, save in January and February 1932 with special licence for that of 10% of the quantity of the same cereals imported in the first quarter of 1931. — (2) Import of rye with special licence is possible without payment of customs duty. — (3) Maize, horsetooth. — (4) Maize, other.	Poland
8.70	36.90	2.50	24.02		
(1)	(1)	(1)	(1)	(1) Special legislation, according to which import is limited to cereals for certain uses and to quantities fixed each year in relation to the needs to be covered after the harvest. Meantime the import of only 1,300 quintals (4,777 bushels) of wheat before the end of the current agricultural year is authorised for the district of Angia do Heroísmo; import duty 65 paper-escudo per quintal (55.19 \$c. per bushel).	Portugal
400	212.71	400	212.71	—	Rumania
(1) 6.50	(1) 110.13	(1) 6.50	(1) 110.13	(1) Import of these products is permitted only according to the regulations prescribed by the Monopoly.	Sweden
(3) 4.50	(3) 77.10	(3) 4.50	(3) 77.19	(1) Brewer's barley. — (2) Barley, other. — (3) Flour suitable for bread-making may be imported only under official authorisation and on payment of a supplementary duty of 20.00 per quintal (343.08 \$c. per barrel).	Switzerland
70.00	184.41	70.00	184.41	a) indicates basic duties; b) supplementary duties; c) trade taxes. — (1) A special duty of 1 % <i>ad valorem</i> is also levied for the authorisation of import. — (2) Maize for feed. — (3) Other maize.	Czechoslovakia
52.00	137.06	52.00	137.06		
8.00	21.10	8.00	21.10		
9.50	389.23	6.50	266.41	(1) Turkish gold pound = 4.397% = 9.54 Turkish paper pounds;	Turkey
(1) 8.00	(1) 137.28	(1) 8.00	(1) 137.28	(1) Import of these products is permitted only under control of the Monopoly.	Yugoslavia

J. P. V. A.

## MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTIONS	Jan.	Jan.	Dec.	Dec.	Average (2)					
	15,	8,	31,	24,	Dec.	Jan.	Jan.	Commercial		
	1932	1932	1931	1931				1930-31	1929-30	
WHEAT.										
Budapest (b): Tisza region (78-80 kg. p. hl.; pengo p. 100 kg.) . . . . .	12.82	13.03	13.02	13.82	13.80	14.32	24.75	15.34	22.94	
Braila: Home grown (79-80 kg. p. hl.; lei p. 100 kg.) . . . . .	...	205	290	290	(3) 294	344	642	351	612	
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.) . . . . .	59 1/2	60 3/8	60	59 1/2	60 3/8	53 3/8	129 1/2	64 1/4	124 3/8	
Chicago: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	55	56 1/2	56 1/2	55 3/4	56	79 3/4	122 1/8	78	114 3/8	
Minneapolis: No. 1 Northern (cents p. 60 lbs.) . . . . .	71 1/8	71 3/8	71 3/8	69 3/4	71 5/8	75 7/8	126 5/8	77 7/8	117 1/2	
New York: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	68 3/8	69 3/8	69 3/4	68 3/4	69	n. q.	130 3/8	91 1/8	121 7/8	
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper per quintal) . . . . .	6.30	6.45	6.35 n.	6.25	6.48	6.20	11.33	6.83	10.65	
Karachi: Karachi white, 2 1/2 % barley, 1 1/2 % dirt (rupees per 656 lbs.) . . . . .	25-12-0	26-0-0	26-0-0	25 12-0	24-2-0	20-2-10	39-14-10	19-15-2	36-6-0	
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	22.30	22.30	21.60	21.30	21.34	25.82	24.59	26.00	25.38	
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No. 3 Manitoba . . . . .	(4) 10.14	(4) 10.39	(4) 10.15	(4) 9.80	(4) 10.00	(4) 11.39	22.60	—	21.30	
No. 2 Hardwinter . . . . .	(5) 9.63	(5) 9.80	(5) 9.80	(5) 9.71	(5) 9.75	n. q.	21.25	n. 13.00	19.49	
Barusso (79 kg. p. hectol.) . . . . .	8.82	8.62	8.42	8.36	8.39	9.55	20.60	11.22	18.72	
Antwerp (Belgian francs p. quintal):										
Home grown . . . . .	74	75	75	75	70 3/4	82	153	95 1/2	154 3/4	
No. 2 Hard Winter, Gulf . . . . .	(5) 83	(5) 83 1/2	(5) 83	(5) 83	(5) 83 1/4	106	185	112 1/2	171	
Paris: Home grown, 75-77 kg. (francs p. quintal) . . . . .	168.25	166.75	165.50	164.75	163.10	173.10	137.00	175.00	130.40	
London: Home grown (shillings per 504 lbs.) . . . . .	26/-	27/-	28/-	(6) 28/-	28/5	23/4	42/6	27/1	40/10	
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):										
South Russian (on sample) . . . . .	n. q.	n. q.	(7) 24/-	(7) 25/-	(7) 25/-	19/3	n. q.	23/7	n. q.	
No. 3 Manitoba . . . . .	27/6	23/6	24/3	27/9	28/2	23/1	48/3	25/4	45/2	
No. 2 Hard Winter . . . . .	(5) 27/3	(5) 28/0	(5) 28/-	(5) 27/9	(5) 27/7	n. q.	45/2	26/4	41/5	
White Pacific . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	26/7	45/11	26/7	42/3	
Rosafte (63 1/2 lbs.), afloat . . . . .	(8) 24/6	(8) 26/-	25/6	(9) 25/0	25/8	19/11	43/10	23/5	40/3	
Choice White Karachi . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	27/-	42/2	
Australian . . . . .	(10) 27/3	(10) 28/3	(10) 28/6	(10) 28/6	(10) 28/6	22/11	46/0	25/7	43/6	
Milan (b): Home grown, soft (liras p. quintal) . . . . .	110.00	110.00	105.00	106.00	103.30	104.20	136.00	109.10	131.80	
Genoa c. i. f. (shillings p. metric ton): La Plata . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	33/8	203/7	110/-	184/6	
RYE.										
Budapest (b): Home grown (pengo p. 100 kg.) . . . . .	13.35	13.07	14.05	14.00	14.34	9.65	13.87	10.79	13.44	
Berlin: Home grown (Reichsmarks per quinta) . . . . .	19.70	19.40	18.50	19.10	19.00	15.58	16.08	17.18	17.04	
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. 100 kg.) . . . . .	8.07	8.36	8.02	8.02	8.19	n. q.	n. q.	7.65	14.57	
Minneapolis: No. 2 (cents per 56 lbs.) . . . . .	46	47	46 1/2	45 1/4	46 1/4	38	88 3/8	42 1/8	80 1/4	
Groningen (c): Home grown (florins per quintal) . . . . .	5.25	4.92	4.75	4.70	4.65	4.31	6.47	4.45	6.33	
BARLEY.										
Braila: Home grown (62-63 kg. p. hl.; lei p. 100 kg.) . . . . .	...	280	272	272	(11) 278	206	308	232	304	
Winnipeg: No. 4 Western (cents p. 48 lbs.) . . . . .	...	34 7/8	35 3/8	35 1/2	35 7/8	19	50 7/8	26 1/8	51 7/8	
Chicago: Feeding (cents per 48 lbs.) . . . . .	43	44	45	43	45 1/4	42 1/4	61 1/8	43 7/8	57 1/8	
Berlin: Home grown fodder (Reichsmarks per quintal) . . . . .	15.75	15.05	14.90	14.90	15.05	19.25	18.09	19.62	17.40	
Antwerp: Danube (francs per quintal) . . . . .	80	81 1/2	79	78	79	66 1/2	115	73 1/4	107 1/2	
London: English malting (shillings p. 448 pounds) . . . . .	37/6	40/-	40/-	(6) 40/-	40/5	37/4	41/8	35/8	39/-	
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):										
Danubian 3 % . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	23/1	15/2	22/8	
Russian (Azoff-Black sea) . . . . .	22/-	23/9	n. q.	n. q.	21/9	12/7	22/2	14/3	18/11	
Canadian Western, No. 3 . . . . .	22/8	25 1/4	24/3	23/6	24/10	14/9	27/3	15/11	27/-	
Californian malting (shillings p. 448 lbs.) . . . . .	41/8	41/-	40/6	41/-	40/11	26/5	33/-	27/8	32/6	
Groningen (c): Home grown winter (fl. p. quintal) . . . . .	5.90	5.90	5.80	5.80	5.77	4.99	8.00	4.97	7.55	

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) 18 Dec.: 285. — (4) No. 2 Manitoba. — (5) No. 1 Hard Winter. — (6) 28 Dec. — (7) Russian Winter, on sample. — (8) 64 lbs. per bushel. — (9) Shipping January-February. — (10) West Australian. — (11) 18 Dec.: 270.

PRODUCTS, MARKETS AND DESCRIPTION	Jan.	Jan.	Dec.	Dec.	Average (1)			
	15,	8,	31,	24,	Dec.	Jan.	Jan.	Commercial
	1932	1932	1931	1931	1931	1931	1930	Season
								1930-31 1929-30
<b>OATS.</b>								
Braila: Home grown (43-44 kg. p. hl.; lei p. 100 kg.)	...	325	307	307	21328	219	271	247 256
Winnipeg: No. 2 White (cents per 34 lbs.)	...	29 3/8	28 1/2	28 3/4	29 7/8	25 3/8	58 7/8	30 58 1/2
Chicago: No. 2 White (cents per 32 lbs.)	28	25 1/2	26 1/4	25 1/2	25 3/8	32 3/4	45 1/8	32 7/8 44 3/8
Buenos Aires (a): Current quality (pesos paper per quintal)	4.50	4.55	4.45	4.45	4.91	3.09	5.05	3.58 5.30
Berlin: Home grown (Reichsmarks per quintal)	13.00	13.80	13.70	13.80	13.77	14.22	14.00	16.17 15.62
Paris: Home grown, black and other (francs per quintal)	102.25	97.75	100.00	96.75	94.25	74.75	76.15	81.00 81.15
London: Home grown white (shillings per 336 lbs.)	21/-	20/6	20/6	20/6	20/6	17/4	22/-	18/4 21/-
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.):								
Danubian (39-40 lbs.)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	4n. 16.6	n. 12/1 4n. 16/4
Plate (f. a. q.)	14/-	15/6	15/6	15/9	16/2	9/2	15/8	10/9 16/1
Chilian Tawny	18/-	18/6	19/-	19/-	19/1	11/8	18/-	12/- 17/8
Milan (b): spot (liras per quintal):								
Home grown	76.50	76.50	76.50	76.50	75.30	73.50	86.50	73.95 80.75
Foreign imported	66.00	63.00	68.00	68.00	68.00	55.10	75.10	60.40 74.30
<b>MAIZE.</b>								
Braila: Danube (lei per quintal)	...	170	152	165	158	199	285	210 309
Chicago: No. 2 Mixed American (cents per 56 lbs.)	37 1/2	18	39	37 1/4	38 1/4	66	85 1/4	58 1/4 85 1/8
Buenos Aires (a): Yellow Plate (pesos paper per quintal)	4.20	4.27	4.25	4.27	4.30	3.76	6.35	3.82 6.17
Antwerp, spot (Belgian francs per quintal):								
Bessarabian	n. q.	n. q.	n. q.	n. q.	n. q.	64 1/2	n. q.	71 1/4 n. 97 1/4
Cinquantino	55	57	56	58 1/2	57 1/4	97 1/4	130	81 131 1/4
Yellow Plate	52	53 1/2	53	54	52 1/2	63 1/2	115	65 109 1/4
London and Liverpool, parcels, c. i. f. (shillings per 480 lbs.):								
Danube	n. q.	n. q.	6 18/6	6 18/6	6 18/7	n. q.	27/5	n. 17/4 24/11
Yellow Plate	17/-	18/-	16/8	17/-	16/9	14/8	26/4	15/8 25/3
No. 2 White African	21/6	21/6	21/-	21/-	21/2	n. q.	28/8	n. 18/11 26/-
Milan (b): Home grown (liras per quintal)	65.50	65.50	63.50	62.50	62.10	48.70	77.00	51.90 71.35
<b>RICE (CLEANED).</b>								
								1931 1930
Milan (b): Maratelli (lire per quintal)	147.50	147.50	139.00	139.00	130.20	107.70	178.50	117.35 152.15
Rangoon: No. 2 Burma (rupees per 7500 lbs.)	260	257 1/2	255	255	260	260	414 1/2	249 3/4 398 1/4
Saigon (Indochinese piastres p. quintal):								
No. 1 Round white (25 % broken)	6.14	6.15	n. q.	n. q.	6.12	7.28	11.96	6.73 11.38
No. 2 Japan (40 % broken)	5.72	5.73	n. q.	n. q.	5.60	6.92	11.56	6.20 10.89
London (a): c. i. f. (shillings per 112 lbs.):								
Spanish Belloch, No. 3 oiled	14/1 1/2	14/1 1/2	13/10	n. q.	13/17	11/5	15/9	11/11 14/1
Italian good, No. 6 oiled	18/10 1/2	15/-	n. q.	n. q.	n. q.	11/8	17/1	13/7 14/11
American Blue Rose	21/-	21/6	21/8	n. q.	22/8	18/5	21/5	18/7 21/9
Burma, No. 2	8/7 1/2	8/7 1/2	8/7	n. q.	8/10	8/1	11/11	8/11 10/11
Saigon, No. 1	9/9	9/10 1/2	9/9	n. q.	9/9	7/11	12/-	8/1 11/6
Slam, Garden, No. 1	n. q.	n. q.	n. q.	n. q.	n. q.	10/1	14/2	9/5 14/-
Tokio: Various qualities (yens per koku)	21.00	21.30	n. q.	n. q.	18.57	n. 17.55	27.00	18.46 25.57
<b>LENSBED.</b>								
Buenos Aires (a): Current quality (pesos paper per quintal)	9.10	9.65	9.75	9.30	9.37	10.46	19.02	10.82 17.19
Antwerp: Plate (Belgian francs p. quintal)	108	111	108	107	109 1/2	164 1/2	844	146 234 1/2
Hull, c. i. f.: Plate (p. sterling p. l. ton)	8-10-0	9-0-0	9-5-0	9-2-1	9-4-3	8-6-9	18-1-2	8-14-1 15-0-5
London, c. i. f.: Bombay bold (p. st. per longton)	11-13-9	11-15-0	11-15-0	11-7-3	11-11-6	12-1-9	21-7-0	11-8-6 17-14-4
Duluth: No. 1, Northern (cents p. 56 lbs.)	186 1/2	187 1/2	184	187	188	157 1/2	307	148 236

(1) Thursday prices. (2) Saturday prices.

(3) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (4) 15 December 1930. — (5) 15 December 1929. — (6) Weight not indicated. — (7) Shipping March-April. — (8) Dan., Galatz-Foxoman.

PRODUCTS, MARKETS AND DESCRIPTION	Average (1)							
	Jan. 15, 1932	Jan. 8, 1932	Dec. 31, 1931	Dec. 24, 1931	Dec. 1931	Jan. 1931	Jan. 1930	Commercial Season
								1930-31 1929-30
<b>COTTONSEED.</b>								
Alexandria : Sakellaridis (piastres per ardeb) . . . .	37.0	58.2	56.0	55.7	56.7	52.5	75.0	52.2 67.9
Hull : Sakellaridis (p. sterl. per long ton) . . . .	5-15-0	6-2-6	5-15-0	5-15-0	5-17-9	5-15-0	7-0-0	5-12-6 6-18-2
<b>COTTON.</b>								
New Orleans : Middling (cents per lb.) . . . . .	6.58	n. q.	6.31	n. q.	2) 6.16	9.88	16.76	10.07 16.17
New York : Middling (cents per lb.) . . . . .	6.75	6.55	6.50	n. q.	3) 6.34	10.32	17.15	10.38 16.60
Bombay : M. g. Broach f. g. (rupees per 784 lbs.) .	218	199	202	197	196	181 7/8	200	191 1/4 288 1/2
Alexandria (a) (talaris per kantar) :								
Sakellaridis f. g. f. . . . .	12.82	12.57	12.22	12.43	12.60	14 5/8	26 7/8	17.12 28 1/8
Ashmouni (Upper Egypt) f. g. f. . . . .	10.35	10.15	10.05	9.90	9.89	11	19 1/8	12.00 19 1/8
Bremen : Middling (U. S. cents per lb.) . . . . .	7.82	7.47	7.49	7.30	7.20	11.18	18.72	11.50 18.27
M. g. Broach fully good (pence per lb.) . . . . .	n. 5.70	n. 5.60	n. 5.50	n. 5.40	n. 5.20	n. 4.64	n. 7.36	n. 4.63 n. 6.83
Le Havre : Middling, Gulf (francs per 50 kilogr.) .	...	...	...	...	...	341	568	349 545
Liverpool (pence per lb.) :								
Middling fair . . . . .	n. 6.41	n. 6.33	n. 6.39	n. 6.29	n. 6.30	n. 6.67	n. 10.67	n. 6.93 n. 10.39
Middling . . . . .	5.41	5.33	5.39	5.23	5.25	5.48	9.37	5.72 9.09
São Paulo, good fair . . . . .	5.61	5.48	5.54	5.39	5.37	5.77	9.54	5.91 9.02
M. g. Broach, fully good . . . . .	n. 5.28	n. 5.10	n. 5.06	n. 4.89	n. 4.83	n. 4.07	n. 7.01	n. 4.25 n. 6.80
Sakellaridis, fully good fair . . . . .	7.25	7.05	7.05	7.05	7.16	8.25	14.43	9.08 14.52
<b>BUTTER.</b>								
								1931 1930
Copenhagen (a) (Kr. p. 100 kg.) . . . . .	190	204	222	222	4) 222	220	286	209 245
Maastricht, auction (b) : Dutch (florins p. kg.) .	1.15	1.18	1.27	1.24	5) 1.19	1.62	2.05	1.38 1.70
Hamburg, auction (b) : Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . . . .	102.78	111.05	116.12	116.41	6) 115.95	141.27	162.75	131.22 146.67
Kempten (b) : Allgäu butter (Pfennige p. half kg.)	7) 97	7) 97	97	97	07	118 1/2	145	110 128
London (a) (shillings p. cwt.) :								
British blended . . . . .	135/4	135/4	135/4	135/4	135/4	135/4	186/8	140/4 158/8
Danish . . . . .	132/-	140/-	140/-	140/-	137/2	141/2	178/5	133/4 153/6
Irish creamery, salted . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	119/3 134/10
Dutch . . . . .	8) 155/-	8) 161/-	n. q.	140/-	n. 143/-	141/2	182/10	132/1 151/11
Argentine . . . . .	109/-	108/-	108/-	106/-	106/9	117/10	159/7	117/7 136/10
Siberian . . . . .	n. q.	n. q.	n. q.	8) 94/-	9) 94/-	n. q.	159/7	(9) 97/4 131/6
Australian, salted . . . . .	108/-	105/-	104/-	106/-	109/9	118/10	161/2	116/8 135/9
New Zealand, salted . . . . .	107/-	107/-	106/-	108/-	111/9	121/5	163/7	119/11 137/8
<b>CHEESE.</b>								
Milan (lire per quintal) :								
Parmigiano-Reggiano, 1st quality of last year's production . . . . .	975	975	975	975	975	1,100	1,187	1,103 1,160
Green Gorgonzola, mature, choice . . . . .	530	540	540	540	546	680	750	616 671
Rome : Roman pecorino, choice (lire p. quintal) .	1,175	1,175	1,175	1,175	1,175	1,003	1,317	1,121 1,207
Alkmaar : Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small; florins, p. 50 kg.) . . . . .	26.50	24.00	22.50	n. q.	22.12	34.50	45.60	32.63 40.83
Gouda : Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.) . . . . .	28.50	28.50	29.50	29.00	30.60	38.80	53.20	37.93 45.56
Kempten (b) : (Pfennige per half kg.) :								
Softcheese, green (20 % butterfat) . . . . .	21 1/2	21 1/2	21 1/2	21 1/2	23 1/2	27	30	24 27
Emmenthal from the Allgäu (whole milk cheese) 1st quality . . . . .	86 1/2	86 1/2	86 1/2	86 1/2	89	98 1/2	102 1/2	97 1/2 (10) 97
London (a) (shillings per cwt.) :								
English Cheddar . . . . .	110/-	108/-	108/-	108/-	105/2	95/-	110/10	99/10 103/4
Canadian . . . . .	74/-	74/-	73/-	73/-	72/7	81/8	102/5	75/9 93/11
New Zealand . . . . .	61/6	62/6	62/6	66/6	67/5	63/6	90/2	68/2 82/2
Liverpool (c) : Engl. Cheshire, ungraded (sh. p. cwt.)	142/4	142/4	142/4	142/4	139/7	99/10	135/4	94/3 96/5

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) 18 Dec.: 6.25; 11 Dec.: 6.08; 4 Dec.: 6.00. — (3) 18 Dec.: 6.32; 11 Dec.: 6.20; 4 Dec.: 6.15. — (4) 17 Dec.: 222. — (5) 16 Dec.: 1.70. — (6) 16 Dec.: 155.99. — (7) Quoting system changed: actual prices are generally 3 Pf. higher than according to the ancient system used in Kempten. — (8) Price for the indicated day and the preceding one. — (9) Average calculated from the prices for the Fridays and the Thursdays which precede. — (10) Average price for all qualities.



## QUARTERLY REVIEW OF PRICES (I)

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year (2)	
		Dec.	Nov.	Oct.	July- Sept.,	Oct.- Dec.	Oct.	1930-31	1929-30
		1931	1931	1931	1931	1930	1929		
GERMANY (Prices in Reichsmarks per quintal).									
A I	Wheat (Berlin) . . . . .	21.34	22.55	21.57	22.19	24.14	23.50	26.39	25.00
	Rye (Berlin) . . . . .	19.00	19.77	18.82	17.56	15.15	17.29	17.15	17.27
	Barley, feeding (Berlin) . . . . .	15.05	16.61	15.70	15.55	17.99	17.50	19.64	17.43
	Oats (Berlin) . . . . .	13.77	14.92	14.33	14.77	14.52	16.21	16.28	15.77
	Potatoes (Berlin) . . . . .	3.40	3.22	3.14	(3) 3.06	2.66	2.39	3.20	4.26
A II	Milk, fresh (Berlin) . . . . .	13.40	14.80	15.00	16.72	17.68	19.14	17.62	16.89
	Butter (Hamburg) . . . . .	231.90	240.90	261.54	260.98	290.09	378.76	282.10	330.68
	Cheese, Emmentaler variety (Kempten) . . . . .	178	188	196	200	182	203	192	205
	Beef (Berlin) (4) . . . . .	72.10	73.20	72.60	89.73	111.60	114.10	106.32	114.84
	Veal (Berlin) (4) . . . . .	73.60	88.20	100.00	97.00	143.33	152.60	126.28	148.02
	Pork (Berlin) (4) . . . . .	82.00	89.00	99.20	105.80	121.07	163.69	110.44	154.09
B I	Basic slag (Aachen) (5) . . . . .	...	0.215	0.25	0.25	0.32	0.32	0.30	0.31
	Superphosphate of lime 18 % . . . . .	...	6.57	6.57	6.51	6.48	6.35	6.51	6.51
	Potash salts 18-22 % (5) . . . . .	...	0.152	0.152	0.152	0.152	0.152	0.147	0.152
	Sulphate of Ammonia (5) . . . . .	0.74	0.72	0.71	0.68	0.82	0.84	0.83	0.86
	Nitrate of lime (5) . . . . .	0.98	0.96	0.96	0.95	0.99	1.04	1.03	1.05
B II	Wheat bran (Hamburg) . . . . .	8.24	9.56	9.26	10.50	8.14	9.82	9.97	9.33
	Linseed cake (Hamburg) . . . . .	12.02	13.92	13.22	13.45	15.39	23.02	15.39	21.08
	Coconut cake (Hamburg) . . . . .	10.44	11.86	11.88	11.88	12.70	18.50	13.32	16.94
	Rapeseed cake (Hamburg) . . . . .	n. q.	n. q.	n. q.	n. q.	8.57	17.88	9.35	15.50
	Groundnut cake (Hamburg) . . . . .	12.00	13.68	11.54	11.51	11.83	20.56	12.50	17.55
	Crushed soya extraction residue (Hamburg) . . . . .	10.46	11.64	11.28	11.96	12.85	18.50	13.44	16.59
DENMARK (Prices in Danish crowns per quintal).									
A I	Wheat (Copenhagen) . . . . .	11.00	11.25	9.50	n. 12.12	11.12	16.00	12.41	16.08
	Barley (Copenhagen) . . . . .	13.75	13.56	11.50	n. 10.98	10.90	14.83	11.18	14.13
	Oats (Copenhagen) . . . . .	13.31	13.12	11.31	12.53	10.83	12.96	11.86	18.69
A II	Butter (Copenhagen) . . . . .	222	209	213	200	231	317	225	280
	Eggs . . . . .	147	152	132	97	176	220	121	149
	Pork (4) . . . . .	63	72	80	84	97	150	98	155
B I	Superphosphate 18 % . . . . .	5.60	5.25	5.25	5.37	5.79	6.18	5.85	6.22
	Potash salts 40 % . . . . .	13.00	12.37	12.25	11.95	12.71	13.00	12.82	13.05
	Sulphate of ammonia . . . . .	n. q.	n. q.	n. q.	11.87	16.88	18.35	17.43	18.55
	Nitrate of lime, Norwegian . . . . .	n. q.	n. q.	n. q.	14.23	16.10	n. q.	16.35	16.47
B II	Rye, imported (Jutland) . . . . .	12.10	11.40	9.20	7.45	8.31	15.35	8.60	13.76
	Maize, Plate (Copenhagen) . . . . .	(6) 9.21	(6) 9.37	(6) 7.89	(6) 7.00	9.43	14.85	8.30	13.47
	Wheat bran (Copenhagen) . . . . .	9.62	9.32	8.40	7.69	8.46	12.53	9.12	11.49
	Cotton seed cake (Copenhagen) . . . . .	13.87	13.77	11.80	11.18	14.49	20.21	14.37	18.96
	Sunflower seed cake (Copenhagen) . . . . .	13.45	13.20	12.10	11.15	13.11	18.23	12.55	15.95
	Groundnut cake (Copenhagen) . . . . .	15.57	15.32	13.45	11.59	12.30	20.12	12.58	17.27
	Crushed soya extraction residue (Copenhagen) . . . . .	13.42	13.12	12.50	11.46	12.69	17.66	13.08	16.00

(1) Each quarter a list is published for several countries containing prices of plant (A I) and animal (A II) products sold by the farmer, as well as of fertilisers (B I), and of concentrated feeding stuffs for livestock (B II) bought by the farmer.

In the case where the market is not indicated, the price is the average one for the country. — The prices paid to farmers for sugar-beet are generally fixed once a year and therefore are not inserted in these tables.

(2) July to June. — (3) Average August-September. — (4) Live weight. — (5) Prices per unit contained in one quintal. — (6) Price in Jutland.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		Dec.	Nov.	Oct.	July-Sept.	Oct.-Dec.	Oct.-Dec.	1930-31	1929-30
		1931	1931	1931	1931	1930	1929		

## FRANCE (Prices in francs per quintal).

A I	Wheat (Paris) . . . . .	163.10	161.50	162.45	165.85	166.90	142.70	173.90	189.70
	Rye (Paris) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. 92.65	n. q.	n. 87.70
	Barley (Paris) . . . . .	n. q.	n. q.	n. q.	n. q.	n. 88.80	102.80	n. 87.00	92.60
	Oats (Paris) . . . . .	94.25	92.40	89.20	84.80	74.00	114.85	79.80	90.20
	Wine, red (southern markets) (1) . . . . .	...	80	91	148	172	103	154	89
A II	Beef (Paris) (2) . . . . .	793	763	823	931	1,078	875	1,050	916
	Pork (Paris) (3) . . . . .	508	524	572	647	695	849	665	851
	Mutton (Paris) (2) . . . . .	906	991	1,125	1,329	1,521	1,477	1,504	1,452
B I	Basic slag, 18 % (Lorraine) . . . . .	23.40	23.40	23.40	23.40	25.20	26.10	24.30	25.95
	Superphosphate 14 % (North and East) . . . . .	27.50	28.15	28.75	29.05	31.40	31.50	31.15	31.60
	Sylvinit, minimum 12 % . . . . .	10.80	10.60	10.60	10.80	10.60	10.95	10.60	10.90
	Nitrate of soda (Dunkirk) . . . . .	106.00	105.00	104.00	102.00	108.00	114.50	109.40	115.70
	Sulphate of ammonia 20.4 % . . . . .	100.00	106.75	106.00	103.25	111.50	119.25	112.20	118.85
B II	Linseed cake (North) . . . . .	83	84	84	87	97	150	103	129
	Coconut cake (Marseilles) . . . . .	70	71	72	73	70	113	73	102
	Groundnut cake (Marseilles) . . . . .	80	82	85	80	91	132	85	116

## GREAT BRITAIN (A: Prices in shillings and pence per cwt;

B: Prices in pounds sterling, etc. per long ton).

A I	Wheat . . . . .	6/9	6/11	6/4	5/11	6/10	9/10	6/6	9/8
	Barley . . . . .	6/11	7/1	6/6	5/9	5/8	7/11	5/10	7/8
	Oats . . . . .	7/9	7/9	7/1	6/7	6/1	7/9	6/4	7/6
	Potatoes (London) . . . . .	9/3	8/6	7/9	6/7	5/11	4/10	7/-	4/-
A II	Butter (London) . . . . .	135/4	140/-	141/9	140/-	144/7	196/-	144/9	177/4
	Cheese, Cheddar (London) . . . . .	105/2	95/6	91/10	97/10	96/2	107/10	98/4	109/1
	Beef (London) (2) . . . . .	67/8	67/8	72/4	79/4	74/11	77/-	79/2	82/10
	Mutton (London) (2) . . . . .	75/3	80/6	86/4	99/7	107/4	103/10	107/10	109/8
	Pork (London) (2) . . . . .	73/6	77/-	82/10	75/10	112/9	124/10	102/10	120/2
B I	Basic slag 14 % (London) . . . . .	2- 1- 0	2- 1- 0	2- 6- 0	2- 1- 0	2- 3- 0	2- 3- 0	2- 2- 3	2- 3- 1
	Superphosphate, 16 % (London) . . . . .	2-17- 0	2-15- 0	2-15- 0	2-19- 0	2- 6- 0	3- 6- 0	3- 3- 6	3- 6- 0
	Kainit 14 % (London) . . . . .	3- 4- 0	3- 0- 0	2-18- 0	2-18-11	3- 1- 5	3- 1- 0	3- 1- 6	3- 1- 2
	Nitrate of soda, 15 1/2 % (London) . . . . .	8-12- 0	8-10- 0	n. q.	8-19- 0	9-12- 0	9-14- 0	9-16- 8	10- 0- 2
	Sulphate of ammonia 20.6 % (London) . . . . .	6-15- 0	6-10- 0	6- 5- 0	7- 0-10	9- 3- 0	9-14- 0	9- 7- 2	9-18- 6
B II	Bran, British (London) . . . . .	5-14- 8	6- 1- 3	5- 7- 6	4-14- 7	4-18- 8	6- 9- 0	4-16- 4	5-18-10
	Bran, middlings, imported (London) . . . . .	5-13- 4	5-13- 9	5- 7- 0	4-12- 2	4-12- 6	6- 4- 0	4-11- 5	5-12- 1
	Linseed cake, English (London) . . . . .	8-19- 0	9- 4- 6	8-12- 0	8- 5- 6	9-16- 7	7-14- 0	9-12- 6	12-19- 5
	Cottonseed cake (London) . . . . .	5-12- 0	5-15- 9	5- 8- 6	4-12- 1	4- 7- 6	7- 5- 0	4-17- 8	6-11- 8
	Coconut cake (London) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	10-13- 0	n. q.	10- 8- 4
	Palm kernel cake (Liverpool) . . . . .	6- 7- 6	6-10- 0	6- 6- 3	6- 0- 0	5- 7- 5	9-10- 0	5- 9- 2	8- 8- 7

## ITALY (Prices in lire per quintal).

A I	Wheat, soft (Milan) . . . . .	103.30	100.00	94.80	91.25	110.80	180.75	111.90	181.45
	Wheat, hard (Palermo) . . . . .	186	190	126	128	181	141	136	141
	Oats (Milan) . . . . .	75.30	73.50	71.40	67.40	76.00	85.85	74.30	82.20
	Maize (Milan) . . . . .	62.10	61.25	58.30	52.75	54.25	82.05	56.30	77.85
	Rice (Milan) . . . . .	139.20	140.00	129.40	102.75	119.65	185.15	125.55	181.20
	Hemp, fibre . . . . .	...	219	209	215	256	454	243	461
	Olive oil (Milan) . . . . .	520	588	682	599	627	610	601	578
	Wine, ordinary, 11° to 13° (Bari) (1) . . . . .	80	85	105	96	121	189	118	186

(1) Price per hectolitre. — (2) Dead weight. — (3) Live weight.

Groups	COUNTRIES AND PRODUCTS	Average							Agricultural year	
		Dec.	Nov.	Oct.	July-Sept.	Oct.-Dec.	Oct.-Dec.	1930-31	1929-30	
		1931	1931	1931	1931	1930	1929			
ITALY (continued)										
A II	Cheese Reggiano (Milan) . . . . .	975	975	1,100	1,170	1,067	1,137	1,139	1,128	
	Eggs, fresh (Milan) (1) . . . . .	7.15	8.02	6.43	4.76	7.73	8.85	5.64	6.26	
	Beef (Milan) (2) . . . . .	323	303	316	338	434	492	404	480	
	Pork (Milan) (2) . . . . .	350	345	376	370	474	664	444	637	
B I	Basic slag 16-20 % (Chiasso) (3)* . . . . .	1.00	1.00	1.08	1.10	1.37	1.50	1.29	1.43	
	Superphosphate, mineral, 15-17 % (Genoa) (3) . . . . .	1.19	1.19	1.19	1.17	1.30	1.30	1.24	1.30	
	Chloride of potassium (Genoa) . . . . .	71.50	71.50	71.50	75.85	80.50	83.75	80.25	83.50	
	Sulphate of ammonia (Genoa) . . . . .	74.50	74.50	74.50	71.40	86.75	89.95	81.75	91.25	
	Copper sulphate (Genoa) . . . . .	129	142	142	103	187	225	182	223	
B II	Wheat bran (Genoa) . . . . .	50	50	54	40	45	65	45	58	
	Rice bran (Milan) . . . . .	40	39	40	38	36	60	36	57	
	Linseed cake (Milan) . . . . .	66	64	63	60	66	109	65	99	
	Groundnut cake (Milan) . . . . .	57	57	57	52	55	92	55	82	
	Rapeseed cake (Milan) . . . . .	32	32	32	33	36	71	37	66	
NETHERLANDS (Prices in guilders per quintal).										
A I	Wheat (Groningen) . . . . .	n. 12.50	n. 12.50	n. 12.50	n. 12.50	6.26	9.69	6.94	9.09	
	Rye (Groningen) . . . . .	4.05	5.24	4.40	4.39	4.50	7.43	4.49	6.72	
	Barley (Groningen) . . . . .	5.77	6.16	5.25	5.25	4.50	8.89	5.00	7.93	
	Oats (Groningen) . . . . .	5.58	6.16	5.20	5.45	5.23	6.69	5.30	6.16	
	Peas (Rotterdam) . . . . .	12.05	13.62	12.12	9.81	10.02	13.72	9.40	12.02	
	Flax, fibre (Rotterdam) . . . . .	57.50	55.50	n. q.	52.00	n. 67	109	61	100	
	Potatoes (Amsterdam) (4) . . . . .	4.55	4.15	3.40	(5) 3.87	3.98	2.52	n. 5.40	2.64	
A II	Butter (Maastricht) . . . . .	119	118	124	133	163	223	157	194	
	Cheese, Gouda 45 % (Gouda) . . . . .	61.20	72.50	74.60	81.35	88.90	115.13	83.09	100.84	
	Cheese, Edam 40 % (Alkmaar) . . . . .	44.25	54.75	59.00	73.47	77.63	102.76	74.44	90.99	
	Eggs (Roermond) (6) . . . . .	5.23	7.06	6.20	5.40	8.57	9.87	5.25	7.22	
	Beef (Rotterdam) (7) . . . . .	73.00	74.50	75.00	80.20	103	106	100	105	
	Pork (Rotterdam) (2) . . . . .	37.50	42.50	43.00	45.15	54	83	49	70	
B I	Basic slag (3) . . . . .	0.101	0.100	0.107	0.103	0.153	0.169	0.144	0.162	
	Superphosphate 17 % . . . . .	2.05	2.30	2.30	2.43	2.79	3.29	2.68	3.15	
	Kainite (3) . . . . .	0.154	0.151	0.151	0.136	0.152	0.151	0.150	0.150	
	Nitrate of soda . . . . .	7.65	7.60	8.30	n. 8.15	n. 10.40	10.45	10.48	10.59	
	Sulphate of ammonia 20 1/2 % . . . . .	4.67	4.59	4.85	4.63	n. 9.75	10.30	9.62	10.06	
B II	Maize . . . . .	3.48	4.11	3.47	3.86	5.09	8.77	5.43	8.54	
	Linseed cake, Dutch . . . . .	6.86	7.42	7.00	7.45	8.90	13.81	9.05	12.24	
	Coconut cake . . . . .	6.50	7.06	7.00	7.35	7.40	10.86	7.88	10.05	
	Groundnut cake . . . . .	7.56	7.90	7.00	6.98	7.08	12.88	7.43	10.95	
POLAND (Prices in zlotys per quintal).										
A I	Wheat (Warsaw) . . . . .	27.00	27.45	23.00	25.86	27.65	39.49	31.17	40.89	
	Rye (Warsaw) . . . . .	27.25	26.32	22.71	22.74	19.01	24.82	21.33	22.72	
	Barley (Warsaw) . . . . .	26.53	27.58	24.76	22.13	26.29	23.08	25.55	26.88	
	Oats (Warsaw) . . . . .	23.97	25.15	23.48	24.56	22.01	24.24	24.01	21.95	
A II	Butter (Warsaw) . . . . .	437	429	411	407	526	673	486	550	
	Beef (Warsaw) (2) . . . . .	82	80	82	83	113	137	108	131	
	Pork (Warsaw) (2) . . . . .	98	98	133	167	167	249	162	238	
	Eggs (Warsaw) (8) . . . . .	224	213	173	140	292	303	205	235	
B I	Superphosphate (3) . . . . .	(9) 0.57	(9) 0.68	0.74	(10) 0.77	0.84	0.90	0.83	0.89	
	Potash salts 25 % . . . . .	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	
	Sulphate of ammonia . . . . .	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	
B II	Wheat bran (Warsaw) . . . . .	16.20	17.00	n. 13.90	14.75	13.83	17.48	16.53	16.64	
	Rye bran (Warsaw) . . . . .	16.15	17.37	n. 13.58	13.48	10.98	14.38	14.19	13.34	
	Linseed cake (Warsaw) . . . . .	27.00	27.50	n. 27.00	n. q.	29.60	44.85	31.41	39.66	
	Rapeseed cake (Warsaw) . . . . .	21.30	20.50	n. 17.65	17.75	20.33	33.43	21.91	29.85	

(1) Dozen. — (2) Live weight. — (3) Prices per unit contained in one quintal. — (4) Hectolitre. — (5) Average August-September. — (6) 100 eggs. — (7) Dead weight. — (8) Box of 1440 eggs. — (9) Nett price: nett price for October: 0.68. — (10) Rectified price.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		Dec.	Nov.	Oct.	July- Sept.	Oct.- Dec.	Oct.- Dec.	1930-31	1929-30
		1931	1931	1931	1931	1930	1929		
SWEDEN (Prices in Swedish crowns per quintal)									
A I	Wheat . . . . .	17.40	17.13	16.22	18.82	18.95	18.27	19.80	18.31
	Rye . . . . .	16.06	16.02	15.48	16.42	15.95	15.30	16.29	14.92
	Barley . . . . .	12.00	11.85	11.49	12.97	11.60	13.33	12.25	13.40
	Oats . . . . .	10.27	10.03	9.05	10.76	9.03	11.22	10.18	10.88
A II	Beef (Göteborg) (1) . . . . .	39.25	40.25	42.50	45.00	56	56	52	56
	Pork (Göteborg) (1) . . . . .	46.87	51.00	54.87	53.55	68	112	65	108
	Butter (Malmö) . . . . .	213.25	199.50	189.50	186.70	214	297	210	262
	Eggs (Stockholm) . . . . .	152.00	157.50	130.00	88.60	232	204	144	151
B I	Superphosphate, 20 % . . . . .	n. 5.90	n. q.	n. q.	n. 7.07	7.48	n. 7.90	7.48	7.85
	Potash salts, 20 % . . . . .	n. 7.75	n. q.	n. q.	7.85	7.87	n. 8.40	7.92	8.25
	Chilisalt peter . . . . .	n. q.	n. q.	n. q.	19.04	18.17	n. q.	18.59	19.38
	Calcium cyanamide . . . . .	n. q.	n. q.	n. q.	18.10	n. q.	n. q.	18.10	18.40
B II	Maize: La Plata . . . . .	9.65	9.75	8.18	7.61	10.08	15.64	10.07	14.73
	Wheat bran . . . . .	10.21	9.75	8.70	8.48	8.65	11.70	9.55	11.12
	Groundnut cake . . . . .	15.82	15.80	13.34	12.61	13.18	20.80	13.52	18.42
	Cottonseed cake . . . . .	13.08	12.34	11.12	n. 11.80	12.47	18.61	12.80	16.98
	Soya meal . . . . .	14.40	13.90	13.40	13.23	13.62	19.13	14.08	17.37
CZECHOSLOVAKIA (Prices in Czech. crowns per quintal).									
A I	Wheat . . . . .	151	149	138	147	138	170	149	172
	Rye . . . . .	151	150	149	148	89	127	108	121
	Barley . . . . .	121	121	123	135	120	143	134	138
	Oats . . . . .	111	118	117	140	100	119	118	117
	Edible potatoes . . . . .	26	25	23	61	28	27	42	37
	Hops . . . . .	630	715	715	517	787	1,302	934	1,496
A II	Butter . . . . .	1,950	2,000	2,000	2,283	2,033	2,183	2,179	2,150
	Fresh eggs (2) . . . . .	1,056	1,106	1,020	820	1,350	1,371	1,067	1,125
	Beef (3) . . . . .	775	900	950	950	1,047	1,267	981	1,156
	Veal (3) . . . . .	975	775	830	833	1,058	1,300	981	1,210
	Pork (1) . . . . .	775	938	1,075	942	1,087	1,470	1,014	1,445
B I	Basic slag, 15 % . . . . .	34.43	34.43	36.67	37.37	39.28	41.90	39.21	40.93
	Superphosphate, 16 to 18 % . . . . .	51.85	51.85	51.85	51.85	51.85	58.65	52.84	58.37
	Kainite, 14 % . . . . .	20.15	20.15	22.92	22.51	23.00	23.90	23.10	23.62
	Chile saltpeter . . . . .	142.50	139.50	144.00	157.25	165.50	165.00	165.16	169.46
	Sulphate of ammonia, 20 1/2 % . . . . .	123.75	119.75	129.75	131.50	140.00	149.33	139.65	149.04
B II	Maize, imported . . . . .	67	68	60	66	78	121	80	120
	Wheat bran (Prague) . . . . .	81	80	73	76	69	86	79	86
	Rye bran (Prague) . . . . .	83	82	75	78	62	86	75	83
	Crushed soya (Prague) . . . . .	116	116	114	116	128	180	133	164
	Rapeseed cake (Prague) . . . . .	100	99	96	102	91	157	99	147
	Linseed cake (Prague) . . . . .	128	126	121	127	136	199	137	182
	Groundnut cake (Prague) . . . . .	128	127	123	123	117	189	125	174

(1) Live weight. — (2) 1440 eggs. — (3) Dead weight.

## THE PRICES OF AGRICULTURAL PRODUCTS DURING THE LAST QUARTER OF 1931

In the following pages the index-numbers of prices of agricultural products and other price-indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled « Index-numbers of prices of agricultural products and other price-indices of interest to the farmer ». We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilisation from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

It is only as a supplement to the figures published in the tables and with all the qualifications that have just been indicated that a table is given below, corresponding to those published at the ends of the preceding quarters and containing the quarterly indices.

### *General index-numbers of prices of agricultural products*

(Base: the first quarter of 1929 = 100).

COUNTRIES	1929	1930				1931			
	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Germany . . .	96.8	87.1	83.2	80.4	83.1	79.9	81.4	77.5	73.0
England and Wales . . .	99.3	100.0	98.1	95.1	88.9	87.5	85.4	83.8	79.2
Estonia (1) . . .	89.1	80.1	72.0	72.5	67.7	63.7	63.9	62.8	(2) 57.7
Finland . . .	87.9	82.2	77.6	76.6	69.2	69.2	66.7	64.5	67.3
Hungary . . .	73.9	68.7	61.9	61.9	59.7	60.4	62.4	64.2	66.4
Italy . . .	88.2	82.3	77.3	75.4	69.5	63.7	65.1	61.4	62.4
Netherlands . . .	97.1	89.3	84.6	86.4	78.9	77.1	78.2	70.7	61.1
Poland . . .	89.8	78.4	76.3	75.0	70.9	64.0	71.4	63.4	68.3
Argentina (1) . . .	98.2	89.5	88.2	83.1	66.4	59.7	59.5	59.5	63.1
Canada . . .	106.1	99.7	92.6	78.3	68.6	61.9	60.2	55.6	55.8
Unit. Stat.: Bu- reau of Agric. Economics . . .	100.7	95.6	91.9	80.9	75.0	67.6	63.7	55.4	50.2
Unit. Stat.: Bu- reau of Labor . . .	96.4	92.3	87.3	79.5	74.5	67.3	63.7	59.3	54.4
New Zealand . . .	87.1	80.5	77.4	75.3	64.1	57.4	59.7	59.6	58.3

(1) See explanation given below. — (2) Average October-November.

The above table shows that the fall in prices of agricultural products still continues in the majority of the countries included, though it is less apparent on account of the devalorisation in several countries: Great Britain, Finland and Argentina — where the index-numbers calculated from prices at inflation values even show an increase — Canada and New Zealand. It is notable that under such circumstances the figures in England and Wales indicate such a considerable fall. The fall has also been very marked in the Netherlands and the United States. In the former country this is the case principally for prices of animal products, amongst which in the first place are the prices of meat but also those of milk products, which have shown a downward movement. In the United States the principal decline is recorded in prices of animals for slaughter. This tendency to decline in animal products may be noted in almost all other countries for which index-numbers are published. It is evident that the governmental measures now taken in almost all the countries (for customs duties and annexed stipulations relating to cereals in Europe see pages 66 to 69 of this Crop Report) have such an influence on the prices of agricultural products that the interdependence of prices in the various countries is much less intimate than in a normal period. Despite this fact there has been, *grosso modo*, a fall everywhere.

\* \* \*

It is necessary to draw attention to certain changes in the tables of index-numbers in this and succeeding numbers of the Crop Report. The " Banco de la Nación Argentina " has changed the index-numbers of meat prices for 1931 and this involves a correction of the general index-numbers of prices of agricultural products for the same period. In addition the Central Statistical Office of Estonia has revised the calculations for all the series of index-numbers it publishes, including that containing the weighted index-numbers of prices of agricultural products and has suppressed the series having 1922 as base-year, so that we shall henceforth publish the series having 1913 as base-year. To facilitate comparison with the periods that no longer enter regularly into these tables there have been inserted below the modified series for Argentina from January to June 1931 and for Estonia from January 1930 to June 1931.

It is also considered opportune to give again for comparison two series of price index-numbers, one for Germany and one for Canada. For Germany it is a question of finished manufactured products for consumption (Gebrauchsgüter), those for production being excepted; this group comprises two sub-groups: 1st: furniture (for kitchens, bedrooms and living rooms, chronometers, lamps, carpets, curtains, beds, linen, iron and steel goods, articles of glass, porcelain and earthenware; 2nd: clothing (underwear for men, women and children, men's suits, women's and children's dresses, cloth, footwear). For Canada the additional index-numbers relate to prices of articles for consumption, other than food, beverages and tobacco, as follows: clothing (boots, shoes, rubbers, hosiery and underwear), household equipment and supplies (coal, coke, petrol, oils, drugs and pharmaceuticals, rubber tires). The data of these two series for January 1930 to June 1931 are also given below.

*Index-numbers of prices — corrections and additions.*

YEAR AND MONTH	ARGENTINA		ESTONIA			GERMANY	CANADA
	Meat	Total agricultural products	Commodities imported	Commodities exported	Agricultural commodities imported and exported	Finished manufactures (»Gebräuchsgüter«)	Consumer's goods (other than foodstuffs, etc.).
January 1930 . . . . .	—	—	120	120	125	168.4	80.8
February » . . . . .	—	—	123	119	120	166.1	89.4
March » . . . . .	—	—	113	110	111	163.3	88.7
April » . . . . .	—	—	116	105	109	161.8	87.5
May » . . . . .	—	—	113	103	106	161.3	86.7
June » . . . . .	—	—	109	103	105	160.9	86.4
July » . . . . .	—	—	106	109	108	159.9	85.9
August » . . . . .	—	—	111	104	107	158.2	85.7
September » . . . . .	—	—	110	105	107	156.7	85.7
October » . . . . .	—	—	133	89	103	154.4	85.4
November » . . . . .	—	—	130	89	102	151.6	84.9
December » . . . . .	—	—	123	84	96	148.8	84.6
Average 1930 . . . . .	—	—	118	103	108	159.3	86.7
January, 1931 . . . . .	90.6	61.7	128	80	93	147.1	82.0
February » . . . . .	93.0	63.3	123	82	95	145.0	82.5
March » . . . . .	94.4	63.2	120	84	95	143.6	81.4
April » . . . . .	93.9	61.4	133	78	94	142.4	80.1
May » . . . . .	89.0	62.5	135	77	94	141.7	79.7
June » . . . . .	92.8	62.7	137	79	96	141.1	80.2

**IMPORT DUTIES ON CEREALS AND FLOUR**

**CHANGES**

TO BE MADE IN THE DUTIES PUBLISHED ON PAGES 66 TO 69 OF THIS CROP REPORT.

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Czechoslovakia . . . . .	Supplementary duty oats . . . . .	January 20	Cz. crs. 33.00	14.20
»	» wheat and rye flour . . . . .	»	» 50.00	131.71

# INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER \*

COUNTRIES AND CLASSIFICATION	Dec. 1931	Nov. 1931	Oct. 1931	Sept. 1931	August 1931	July 1931	Dec. 1930	Dec. 1929	Year	
									1930	1929
<b>GERMANY</b> (Statistisches Reichsamt) 1913 = 100.										
Foodstuffs of vegetable origin . . . . .	112.8	115.6	112.5	111.7	114.6	126.1	111.3	120.4	115.3	126.8
Livestock . . . . .	84.4	71.4	78.0	84.7	89.0	81.7	104.4	125.7	112.4	126.6
Livestock products . . . . .	101.1	107.4	108.7	108.4	107.9	105.6	126.6	146.3	121.7	142.1
Feeding stuffs . . . . .	98.6	98.7	95.5	96.8	98.3	104.7	91.1	105.0	93.2	125.9
Total agricultural products . . . . .	94.5	98.5	98.5	101.1	103.4	105.4	110.4	126.2	113.1	136.2
Fertilizers . . . . .	70.4	72.1	74.0	73.6	72.8	71.3	80.5	83.7	82.4	84.5
Agricultural dead stock . . . . .	128.3	128.6	129.5	129.7	129.9	129.9	136.0	141.0	139.4	141.3
Finished manufactures (" Gebrauchs- güter ") (2) . . . . .	132.4	134.2	135.8	137.8	139.7	140.6	148.8	148.8	168.7	171.6
General index-number . . . . .	103.7	106.6	107.1	108.6	110.2	111.7	117.8	134.3	124.6	187.2
<b>ENGLAND AND WALES</b> (Ministry of Agriculture) Average of corresponding months 1911-13 = 100.										
Agricultural products . . . . .	117	112	113	120	121	121	126	143	134	144
Feeding stuffs . . . . .	93	97	83	76	77	81	81	119	96	139
Fertilizers . . . . .	91	90	89	83	95	100	101	100	101	100
General index-number (1) . . . . .	100.5	97.6	96.8	94.0	98.1	94.4	102.2	128.0	114.1	135.3
<b>ARGENTINA</b> (Banco de la Nación argentina) 1926 = 100.										
Cereals and linseed . . . . .	58.2	65.6	63.3	52.7	53.7	55.1	56.6	90.6	82.3	100.4
Meat (2) . . . . .	77.1	84.8	90.8	100.0	97.4	92.0	90.6	109.0	110.9	113.3
Hides and skins . . . . .	59.1	66.3	61.5	53.4	59.3	63.1	65.6	78.0	71.6	95.0
Wool . . . . .	51.7	58.0	60.3	54.3	55.8	52.4	51.8	84.3	67.4	103.5
Dairy products . . . . .	66.6	70.7	74.2	75.8	84.8	84.0	68.7	99.9	82.4	105.9
Forest products . . . . .	80.5	81.7	83.5	89.5	91.6	107.1	108.7	111.8	107.9	111.5
Total agricultural products (2) . . . . .	61.4	68.6	67.7	61.3	62.3	62.9	63.2	98.8	85.5	102.6
<b>CANADA</b> (Internal Trade Branch of the Dominion Bureau of Statistics) 1926 = 100.										
Field products (grain, etc.) . . . . .	42.2	46.0	44.0	41.1	43.0	44.8	43.1	93.8	70.0	93.8
Animals and animal products . . . . .	71.1	72.1	72.1	72.5	74.3	73.2	93.1	112.5	102.9	112.5
Total Canadian farm products . . . . .	53.0	55.8	54.5	52.8	54.7	55.4	61.8	100.8	82.3	100.8
Fertilizers . . . . .	71.1	75.5	75.5	74.8	86.8	86.9	89.2	92.6	83.2	92.6
Consumer's goods (other than foodstuffs, etc.) (2) . . . . .	...	77.7	78.1	78.6	79.4	80.0	84.6	90.0	86.7	91.1
General index-number . . . . .	70.3	70.6	70.4	70.0	70.9	71.7	77.7	95.6	86.6	95.6
<b>ESTONIA (2)</b> (Central Bureau of Statistics) 1913 = 100.										
Commodities imported . . . . .	...	124	127	129	135	136	123	131	118	140
Commodities exported . . . . .	...	70	70	75	74	74	84	127	103	139
Agricultural products imported and exported . . . . .	...	85	80	90	95	94	96	128	103	139

\* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-Indices of Interest to the Farmer" (Rome, 1930).  
(1) Calculated by the "Statist", reduced to base-year 1913 = 100. — (2) See explanation: pages 77 to 79.



COUNTRIES AND CLASSIFICATION	Dec.	Nov.	Oct.	Sept.	August	July	Dec.	Dec.	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
<b>UNITED STATES</b> (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals . . . . .	52	57	46	50	54	57	80	119	100	121
Fruits and vegetables . . . . .	68	68	70	83	97	110	108	163	158	136
Meat animals . . . . .	68	76	79	86	92	92	112	143	134	156
Dairy products . . . . .	92	95	95	92	87	85	117	140	123	140
Poultry and poultry products . . . . .	120	123	110	99	93	83	127	204	126	150
Cotton and cottonseed . . . . .	45	50	42	47	53	71	73	130	102	145
Total agricultural products . . . . .	66	71	68	72	75	79	97	135	117	138
Commodities purchased by farmers (1) . . . . .	123	123	126	127	127	129	139	154	146	155
Agricultural wages (1) . . . . .	—	—	—	113	—	—	129	(2) 159	152	170
<b>UNITED STATES</b> (Bureau of Labor) 1926 = 100.										
Grains . . . . .	47.0	51.3	44.3	44.2	44.8	49.0	64.0	97.5	58.3	97.4
Livestock and poultry . . . . .	51.7	55.7	57.6	61.0	67.0	63.0	76.3	94.6	89.2	106.1
Other farm products . . . . .	61.2	63.1	64.2	65.4	67.3	71.3	78.1	108.2	91.1	106.6
Total farm products . . . . .	55.7	58.7	58.8	60.5	63.5	64.9	75.2	101.9	88.3	104.9
Agricultural implements . . . . .	92.1	92.1	92.3	94.5	94.5	94.5	94.9	96.1	95.1	97.9
Fertilizer materials . . . . .	70.1	70.1	70.2	74.2	74.4	78.7	81.4	89.5	85.6	92.1
Mixed fertilizers . . . . .	77.1	77.7	77.2	77.6	78.7	80.2	90.6	97.1	93.6	97.2
Cattle feed . . . . .	53.9	59.8	40.4	44.4	50.8	55.8	78.2	122.4	99.7	121.6
Non-agricultural commodities . . . . .	69.3	71.0	71.2	71.7	72.1	71.5	79.4	92.1	85.9	94.4
General index-number . . . . .	66.3	68.3	68.4	69.1	70.2	70.0	78.4	94.4	86.3	96.5
<b>FINLAND</b> (Central Bureau of Statistics) 1926 = 100.										
Cereals . . . . .	33	81	73	70	76	79	72	82	76	98
Potatoes . . . . .	54	49	49	50	84	101	59	88	76	148
Fodder . . . . .	71	62	53	52	60	65	58	67	62	60
Meat . . . . .	57	51	54	59	64	65	72	93	83	108
Dairy products . . . . .	62	88	77	72	70	74	103	84	84	103
Total agricultural products . . . . .	78	72	67	66	70	71	73	92	82	100
General index-number . . . . .	92	87	82	79	81	82	86	95	90	98
<b>HUNGARY</b> (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products . . . . .	89	89	88	88	88	87	78	97	—	—
General index-number . . . . .	90	99	97	96	92	95	90	107	—	—
<b>ITALY</b> (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products . . . . .	342.35	336.84	337.20	334.23	330.21	337.05	356.88	474.78	413.39	508.76
General index-number . . . . .	325.54	328.74	329.85	330.33	331.42	337.43	368.63	459.18	411.04	480.69
<b>NEW ZEALAND</b> (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce . . . . .	91.5	102.6	106.9	102.9	103.7	96.7	102.6	144.1	120.7	145.7
Meat . . . . .	137.8	113.1	119.6	120.7	127.9	126.0	180.0	163.2	164.7	173.9
Wool . . . . .	61.7	66.2	61.6	63.0	68.9	73.2	59.3	127.4	100.7	170.9
Hides, skins, and tallow . . . . .	67.0	67.9	60.0	79.8	82.1	83.4	122.6	163.7	145.4	188.6
Miscellaneous . . . . .	135.8	98.1	122.1	109.8	98.9	122.1	129.8	155.1	134.0	146.7
Total agricultural products . . . . .	94.8	97.8	101.2	99.7	100.5	100.1	101.3	142.5	122.7	161.3

(1) 1910-14 = 100. — (2) January following.

COUNTRIES AND CLASSIFICATION	Dec.	Nov.	Oct.	Sept.	August	July	Dec.	Dec.	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
<b>NORWAY</b> (Kgl. Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals . . . . .	110	110	106	111	112	111	99	142	(1) 114	(1) 155
Potatoes . . . . .	126	119	109	97	170	257	158	106	(1) 152	(1) 120
Pork . . . . .	90	88	92	86	91	83	98	153	(1) 98	(1) 141
Other meat . . . . .	126	121	127	137	158	160	193	198	(1) 198	(1) 199
Eggs . . . . .	114	132	126	117	87	81	146	180	(1) 121	(1) 135
Dairy products . . . . .	136	133	131	127	126	125	150	171	(1) 150	(1) 161
Concentrated feeding stuffs . . . . .	108	102	97	97	102	103	111	147	(1) 117	(1) 143
Maize . . . . .	85	81	73	71	79	81	93	140	(1) 103	(1) 143
Fertilizers . . . . .	86	86	81	81	85	96	95	105	(1) 101	(1) 108
<b>NETHERLANDS</b> (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil . . . . .	57	59	58	57	61	67	59	65	(2) 67	(2) 68
Animal products . . . . .	53	57	58	64	68	70	74	99	(2) 77	(2) 95
Total agricultural products . . . . .	54	58	58	62	67	69	71	80	(2) 75	(2) 88
Agricultural wages . . . . .	95	95	95	95	95	95	100	100	(2) 99	(2) 100
General index-number (3) . . . . .	...	60.2	60.2	61.6	63.7	65.6	72.4	91.3	79.2	96.1
<b>POLAND</b> (Central Bureau of Statistics) 1927 = 100.										
Products of the soil . . . . .	...	59.1	51.0	46.6	47.7	48.2	46.4	62.0	52.1	73.1
Products of agricultural industry . . . . .	...	68.7	61.8	60.1	62.1	64.1	63.0	73.6	69.0	80.0
Total products of plant origin . . . . .	62.4	64.2	56.6	53.3	54.8	56.0	54.0	60.2	60.5	76.9
Animals . . . . .	...	43.7	47.5	50.3	66.2	67.0	68.6	95.6	82.4	98.4
Dairy products . . . . .	...	76.9	66.3	63.3	61.2	59.2	61.0	103.0	81.5	102.9
Total products of animal origin . . . . .	51.8	56.4	55.3	61.3	64.2	63.6	78.2	98.0	81.0	100.0
Total agricultural products . . . . .	57.2	60.3	55.6	56.2	58.3	58.8	63.2	82.2	68.5	85.7
Fertilizers . . . . .	...	118.5	118.5	118.5	118.5	118.5	124.7	130.6	127.8	121.7
Industrial products . . . . .	74.0	74.5	75.3	76.0	77.8	80.1	86.9	101.1	94.0	103.3
General index-number . . . . .	66.4	68.2	66.3	67.0	69.0	70.3	76.2	92.0	82.3	95.7
<b>YUGOSLAVIA</b> (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil . . . . .	70.6	70.9	71.1	70.4	75.7	78.9	72.5	102.3	89.3	118.6
Animal products . . . . .	58.6	63.6	66.1	70.6	75.6	74.7	86.4	95.8	96.3	107.2
Industrial products . . . . .	68.5	68.7	69.3	72.2	70.8	71.3	75.2	89.2	81.8	92.6
General index-number . . . . .	67.2	68.6	69.5	71.6	73.6	74.4	78.0	93.7	86.6	100.6

(1) Agricultural year April 1-March 31. — (2) Agricultural year July 1-June 30. — (3) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100.

## RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	Jan.	Jan.	Dec.	Dec.	Average				Commercial Season	
	15,	8,	31,	24,	Dec.	Jan.	Jan.			
	1932	1932	1931	1931						1931
SHIPMENTS OF WHEAT AND MAIZE.										
Danube to Antwerp/Hamburg . . . . .	(shill. per 2240 lbs.)	n. q.	n. q.	n. q.	n. 15/3	15/4	n. q.	n. q.	13/11	15/8
Black Sea to Antwerp/Hamburg . . . . .		11/1½	11/3	10/9	10/9	10/11	10/11	n. q.	10/10	n. q.
St. John to Liverpool (1) . . . . .		1/6	1/6	1/6	1/6	1/8	1/6	1/6	1/6	1/5
Montreal to United Kingdom . . . . .	(shill. per 480 lbs.)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1/10	1/10
Gulf to United Kingdom . . . . .		(1) 2/3	(1) 2/3	(1) 2/3	(1) 2/3	(1) 2/7	(1) 1/9	2/5	2/3	2/6
New York to Liverpool (1) . . . . .		1/6	1/6	1/6	1/6	1/7	1/6	1/7	1/6	1/6
Northern Range to U.K. and Continent		1/7 ½	n. q.	n. q.	n. q.	n. q.	1/8	1/10	1/9	1/9
North Pacific to United Kingdom (sh. per 2240 lbs.)		n. q.	n. 23/6	23/6	23/6	23/10	22/6	22/7	22/3	22/7
Vancouver to Yokohama (1) (gold \$ per sh. ton) (2)		2.45	2.45	2.45	2.25	2.30	2.78	2.80	2.72	2.78
La Plata Down River (3) to U. K./Continent	(shill. per 2240 lbs.)	17/-	17/3	17/6	17/6	16/2	16/2	12/11	16/4	12/8
La Plata Up River (4) to U. K./Continent		18/-	18/3	18/6	18/6	17/8	18/-	14/5	18/-	14/4
Karachi to U. K./Continent (5) . . . . .		n. q.	n. q.	n. q.	n. q.	n. q.	20/9	n. q.	19/3	n. 15/4
Western Australia to U.K./Continent . . . . .		28/6	27/6	28/9	20/-	20/1	30/2	24/7	29/8	25/7
SHIPMENTS OF RICE.										
Saigon to Europe . . . . .	(shill. per 2240 lbs.)	(1) 25/6	(1) n. 25/-	(1) n. 25/-	(1) n. 26/3	(1) 25/6	n. 23/6	(1) 26/2	23/9	n. 18/11
Burma to U.K./Continent . . . . .		26/3	26/3	27/-	n. 26/-	26/4	23/-	20/-	24/3	n. 17/8

(1) Rates for parcels by liners. — (2) Freight rates for the past months too also expressed in gold \$. — (3) "Down River", includes the ports Buenos Aires and La Plata. — (4) "Up River" includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight. — (5) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs.

## EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	January 15, 1932	January 8, 1932	December 31, 1931	December 24, 1931
Germany . . . . .	Berlin	— 0.4	— 0.4	— 0.4	— 0.4
Argentina . . . . .	New York	— 39.3	— 39.3	— 39.3	— 39.3
Belgium . . . . .	Brussels	+ 0.1	— 0.1	— 0.0	+ 0.5
Canada . . . . .	New York	— 15.9	— 15.3	— 16.7	— 18.3
Denmark . . . . .	Copenhagen	— 28.5	— 30.0	— 29.7	— 29.7
Egypt . . . . .	London	— 28.4	— 30.0	— 30.8	— 29.6
France . . . . .	Paris	+ 0.1	— 0.0	— 0.0	+ 0.3
Great Britain . . . . .	London	— 28.4	— 30.0	— 30.8	— 29.6
Hungary . . . . .	Budapest	— 0.0	— 0.0	— 0.0	— 0.0
India . . . . .	London	— 27.9	— 29.5	— 29.7	— 23.9
Indo-China . . . . .	Paris	+ 0.1	— 0.0	— 0.0	+ 0.3
Italy . . . . .	Milan	— 3.5	— 3.0	— 3.0	— 2.3
Japan . . . . .	New York	— 24.0	— 26.9	— 29.8	— 19.2
Netherlands . . . . .	Amsterdam	— 0.2	— 0.2	— 0.2	— 0.2
Rumania . . . . .	New York	— . . .	— 0.9	— 0.8	— 0.9

(1) The percentage represents the premium or the loss as far as possible on the national exchange. On the following page may be found the table of reciprocal parities of the currencies considered; by the aid of this table and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Crop Report refer. — (2) During the preceding months the rate of exchange of the leu in New York was nearly at par level.

**RECIPROCAL PARITIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN  
THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).**

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	United States	Denmark	Egypt	France	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Rumania	Czechoslovakia	Former Latin monetary union (3)
Germany . . . . .	Reichsmark	1	0.561	8.566	0.238	0.880	4.819	0.080	0.979	1.302	0.653	4.526	0.478	0.568	2.123	39.825	8.040	1.285
Argentina . . . . .	Paper peso	1.782	1	15.263	0.424	1.584	8.586	10.883	1.744	2.427	1.103	8.064	0.851	1.056	3.872	70.059	14.826	2.200
Belgium . . . . .	Franc	0.117	0.065	1	0.028	0.104	0.563	0.710	0.114	0.159	0.076	0.528	0.056	0.069	0.248	4.449	0.939	0.145
Canada . . . . .	Dollar	4.198	2.356	35.950	1	3.731	20.230	25.524	4.119	5.718	2.740	10.000	2.006	2.488	8.914	167.181	33.751	5.183
United States . . . . .																		
Denmark . . . . .	Crown	1.126	0.631	9.637	0.203	1	5.422	0.840	1.101	1.532	0.794	5.092	0.535	0.667	2.389	44.893	9.045	1.389
Sweden . . . . .																		
Egypt . . . . .	Piastre	0.207	0.016	1.777	0.049	0.184	1	1.202	0.203	0.283	0.135	0.939	0.099	0.123	0.441	8.264	1.068	0.256
France . . . . .	Franc	0.164	0.092	1.409	0.089	0.146	0.793	1	0.161	0.224	0.107	0.744	0.079	0.097	0.349	6.550	1.322	0.203
Indo-China . . . . .	Piastre (2)																	
Great Britain . . . . .	Shilling	1.021	0.573	8.750	0.243	0.998	4.923	6.211	1	1.391	0.667	4.623	0.438	0.605	2.169	40.680	8.213	1.261
Hungary . . . . .	Pengő	0.784	0.412	6.289	0.175	0.653	3.580	4.464	0.720	1	0.479	3.323	0.351	0.435	1.559	29.240	5.903	0.906
India . . . . .	Rupce	1.532	0.860	13.125	0.365	1.362	7.384	9.316	1.500	2.087	1	6.935	0.732	0.908	3.254	61.020	12.319	1.892
Italy . . . . .	Lira	0.221	0.124	1.892	0.053	0.196	1.065	1.343	0.216	0.301	0.144	1	0.106	0.131	0.469	8.769	1.776	0.273
Japan . . . . .	Yen	2.092	1.174	17.924	0.498	1.800	10.064	12.723	2.049	2.850	1.399	9.471	1	1.240	4.443	83.333	16.824	2.583
Netherlands . . . . .	Florin	1.687	0.947	14.454	0.402	1.450	8.182	10.260	1.652	2.298	1.101	7.637	0.806	1	3.583	67.200	13.567	2.033
Poland . . . . .	Zloty	0.471	0.264	4.034	0.112	0.419	2.269	2.863	0.461	0.641	0.307	2.131	0.225	0.279	1	18.755	3.786	0.581
Rumania . . . . .	Leu	0.025	0.014	0.215	0.006	0.022	0.121	0.163	0.025	0.084	0.016	0.114	0.012	0.015	0.053	1	0.202	0.031
Czechoslovakia . . . . .	Crown	0.124	0.070	1.065	0.030	0.111	0.589	0.756	0.122	0.169	0.081	0.563	0.059	0.074	0.264	4.953	1	0.154
Former Latin monetary union (3) . . . . .	Gold Franc	0.810	0.453	6.938	0.193	0.720	3.903	4.925	0.793	1.103	0.529	3.066	0.387	0.430	1.720	32.256	6.512	1

(1) Each figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) 1 Gold piastre equal to 10 francs. — (3) Data for purpose of comparison.

# MONTHLY CROP REPORT

## AND AGRICULTURAL STATISTICS

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*At this period of the year many Governments suspend their monthly crop condition reports until next spring when they again commence.*

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*The following notes refer to crop conditions quoted in the crop reports and in the tables.—Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield.—For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.*

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### CEREALS

The information on areas sown to winter wheat recently received at the International Institute of Agriculture shows that the total acreage sown last autumn was larger than anticipated on the basis of the preliminary data.

As regards Europe (excluding the U. S. S. R.), the figures available cover a number of countries which normally cultivate about two-thirds of the total winter wheat area of the continent. On the basis of these data it seems that the European acreage is slightly larger than that of last year. The increases in area in several countries, especially in France and, to a smaller extent, in Germany and Italy, have not been completely counterbalanced by the decreases which have taken place in Rumania, Poland and Spain.

For the U. S. S. R. the data recently communicated by the Government show, on the contrary, a large increase in the area sown to winter wheat of about 3,310,000 acres (11.4 %) compared with that of last year.

A relatively large increase is also indicated by the first estimate of acreage sown in India; the wheat area this year is about 2,100,000 acres (6.8 %) larger than in 1931.

The figures, still incomplete, for the producing countries of North Africa give reason to believe that in these regions also sowings are rather larger than last year.

Among the extra-European countries, only Canada and the United States have made a relatively large reduction in the winter wheat area, amounting to about 4,500,000 acres compared with 1931. This decrease, however, only partly compensates for the increase which has taken place in other countries.

In conclusion, on the basis of all the data at present available covering a group of countries which normally produce about four-fifths of the total winter wheat, it may be estimated that the increase in total area sown to this crop as against that sown in the previous season is in the neighbourhood of a million acres.

For rye, on the contrary, the increase in total European sowings due to an increase in the area sown to winter rye in the principal producing countries (Germany, Poland,

France), does not counterbalance the large decrease in the U. S. S. R., where this crop occupies about 4,600,000 acres less than last year. In North America, there has also been made a reduction of about 340,000 acres.

There is therefore certainly on the whole a decrease in the area under winter rye considerably larger than the anticipated increase in the winter wheat area.

*Area sown with winter cereals.*

COUNTRIES	WHEAT			RYE			BARLEY			OATS		
	1931/32	% 1931/32		1931/32	% 1931/32		1931/32	% 1931/32		1931/32	% 1931/32	
		1930-	1925-		1930-	1925-		1930-	1925-		1930-	1925-
		1931	to		1931	to		1931	to		1931	to
		= 100	1929- 1930 = 100		= 100	1929- 1930 = 100		= 100	1929- 1930 = 100		= 100	1929- 1930 = 100
(thousand acres)												
Germany . . .	4,880	104.9	128.3	11,112	104.7	97.8	583	108.9	131.4	—	—	—
Bulgaria . . .	2,995	100.0	109.0	558	99.0	115.1	489	101.0	107.4	—	—	—
Spain . . .	10,601	95.2	98.3	1,489	95.0	88.6	4,553	100.2	101.6	1,826	94.1	96.0
Finland . . .	80	92.3	112.3	544	96.0	98.7	—	—	—	—	—	—
France . . .	12,894	110.0	102.8	1,791	102.7	94.3	492	92.9	105.6	2,205	101.4	109.1
Italy . . .	12,032	100.3	—	—	—	—	—	—	—	—	—	—
Lithuania . . .	376	99.3	142.6	1,229	98.4	106.1	—	—	—	—	—	—
Poland . . .	—	96.7	—	—	100.4	—	—	99.1	—	—	—	—
Rumania . . .	5,596	90.9	—	686	85.4	—	245	98.7	—	—	—	—
U. S. S. R. . .	32,337	111.4	132.2	64,765	93.4	93.0	872	100.4	85.9	—	—	—
Canada . . .	518	92.5	52.7	539	90.1	73.7	—	—	—	—	—	—
United States . .	38,682	89.6	89.6 (1)	3,712	93.0 (2)	96.3	—	—	—	—	—	—
British India: . .	32,437	106.8	108.1	—	—	—	—	—	—	—	—	—
Algeria . . .	3,633	(3)	106.7	4	77.2	97.7	3,064	103.3	92.1	556	107.1	93.4
Cyrenaica . . .	6	32.7	18.4	—	—	—	47	57.7	47.5	—	—	—
Tunis . . .	2,100	110.4	118.1	—	—	—	1,236	113.6	100.1	99	100.0	96.0

(1) Acreage sown for grain allowance being made for average diversion to other uses. — (2) Percentage of the mean for 1926/27 to 1929/30. — (3) Area sown last year at the same date (1 February 1932): 2,958,000 acres; final estimate of the area harvested: 3,640,000 acres.

In Europe mild and generally dry weather predominated in January causing the snow to melt in most areas and accelerating sprouting more than normally. Thus the situation of sowings was generally satisfactory; only some complaints of abundant weeds and some local insect and rodent damage was reported.

Fears were entertained regarding the possible consequence of the unexpected return of intense cold and frosts. Temperatures did in fact fall sharply in the first half of February and severe frosts occurred over the whole European area. In the areas where snow had previously fallen damage was limited; this damage has even been compensated for by the humidity brought by the snow in areas where there had been complaints of lack of precipitation at the beginning of the winter. The cold has also rid the fields of the insects and rodents that infested them and has slowed down the too rapid progress of vegetation. These conditions have predominated in western Europe and particularly in France and Italy. In the central and eastern regions, where the cold supervened more brusquely, it is to be feared that crops have suffered more; so far there are reports of serious damage only in Hungary but it is not impossible that there have been losses to sowings in other countries. The majority of the fields being

still under snow it is impossible to make an exact estimate of the damage caused ; the thaw must be awaited.

The U. S. S. R. has experienced the conditions general to Eastern Europe ; mild temperatures in January, almost complete absence of snow and a brusque return of cold and snow in February. The formation of a layer of ice on some fields may be taken as an index of the damage caused.

In India January was hot and almost wholly dry, to the detriment of crops, which had very great need of water at the beginning of February ; the weather remained dry in the first week of the current month and only in the second week rain fell over a large part of the Punjab. Crop prospects are mediocre.

In the United States also January was dry with mild temperatures, so that the winter wheat belt was deprived of its usual snow cover. Some frosts caused damage but this was not important. In the first half of February abundant snow fell and at the middle of the month crop condition was generally good.

In North Africa the situation at the beginning of February was considered satisfactory, thanks to abundant rains throughout the cultivated belt.

G. C.

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*Austria* : Abundant rains fell in the first week of January but the rest of the month was without precipitation. At the end of January there was almost no snow in the agricultural regions and even in the high mountains it was relatively scarce. On the plains autumn sowings have not in general suffered from the lack of snow, as cloud has somewhat mitigated the intensity of the frosts. On moderately high ground, on the other hand, where cloud protection was frequently lacking, serious, though only sporadic, damage was occasioned by frosts. On 1 February crop condition of winter cereals was as follows : wheat 2.7 (against 2.4 on 1 January this year and 2.4 on 1 February 1931) ; rye 2.5 (2.4, 2.4) and barley 2.4 (2.3, 2.4).

*Belgium* : The latest estimate of production of spelt in 1931 is 587,000 centals compared with 580,000 in 1930 and 735,000 on the average for the preceding quinquennium. Percentages : 101.1 and 79.8. Corresponding figures for meslin are respectively as follows : 100,000 centals (173,000 bushels) ; 106,000 (183,000) ; 199,000 (344,000) ; 94.5 % and 50.2 %.

Temperatures in January were very mild and rainfall small. Thanks to the favourable weather winter cereals are well developed and vigorous. Work in the fields was carried out under the best conditions and is far advanced. In some districts sowings of oats have begun ; cultivation of this crop will probably be extended.

*Bulgaria* : In January cold weather predominated almost throughout the country. Sowing of autumn cereals was effected under good conditions and germination occurred regularly and uniformly. A sufficient snow-cover has protected sowings. Preparations for spring sowings have not yet begun.

*Irish Free State* : Weather during the greater part of January was mild and genial ; early-sown seed germinated satisfactorily and progressed favourably but later-sown seed was reported to be poor and thin. Ploughing for spring sowing was almost completed under good conditions.

*France* : Weather conditions having been on the whole favourable, winter cereal sowings, the total area of which has decreased uninterruptedly since 1925, have again, with an area of 17,500,000 acres, reached the normal level of 1921-1925.

## Cereals.

COUNTRIES	(†) AREA					(†) PRODUCTION							
	1931	1930	Average	% 1931/32		1931	1930	Average	1931	1930	Average	% 1931/32	
	—	—	to 1929	1930/31	Aver.	—	—	to 1929	—	—	to 1929	1930/31	Aver.
	1931/32	1930/31	1925/26 to 1929/30			1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30		
	1,000 acres					1,000 centals			1,000 bushels				
WHEAT													
Germany . . . . .	5,355	4,402	4,067	121.7	131.6	98,329	83,531	71,859	155,545	139,216	119,768	111.7	126.9
Austria . . . . .	507	508	504	99.8	100.6	5,631	7,205	6,786	9,384	12,008	11,309	78.2	88.0
Belgium . . . . .	381	411	375	92.8	101.7	3,291	7,942	8,879	13,817	13,236	14,709	104.4	98.4
Bulgaria . . . . .	2,964	3,006	2,862	98.6	111.3	36,718	34,391	24,285	61,195	57,317	40,474	106.8	151.2
Denmark . . . . .	259	249	247	104.2	105.0	5,953	6,130	6,229	9,921	10,216	10,382	97.1	95.6
Spain . . . . .	11,245	11,184	10,704	101.0	105.1	80,657	88,021	87,709	134,426	146,699	146,179	91.6	92.0
Estonia . . . . .	99	90	66	109.6	150.6	1,043	981	605	1,738	1,635	1,009	106.3	172.2
Finland . . . . .	47	51	40	92.7	116.7	696	726	582	1,161	1,210	986	95.9	124.0
France . . . . .	12,497	13,280	13,240	94.1	94.4	161,781	136,865	174,815	269,680	238,104	291,353	118.2	92.5
Great Britain . . . . .	1,250	1,405	1,551	89.0	80.6	22,605	25,352	31,105	37,775	42,253	51,841	89.4	72.9
Greece . . . . .	...	1,396	1,251	...	...	7,387	5,826	7,384	12,238	9,709	12,228	125.9	100.0
Hungary . . . . .	4,004	4,187	3,821	95.6	104.8	41,613	50,604	47,726	69,186	84,338	79,542	82.0	87.0
Italy . . . . .	12,075	11,917	12,156	101.3	99.8	148,763	126,044	137,524	247,933	210,696	229,203	118.0	108.2
Latvia . . . . .	215	179	139	120.2	154.3	2,033	2,439	1,380	3,388	4,066	2,299	83.3	147.3
Lithuania . . . . .	478	526	352	91.0	138.1	5,004	6,796	3,647	8,340	11,327	6,079	73.6	137.2
Luxembourg . . . . .	23	25	30	89.2	74.8	244	265	344	406	442	573	91.8	70.9
Malta . . . . .	10	9	9	104.8	105.8	166	182	175	277	303	292	91.6	94.9
Norway . . . . .	29	30	25	94.2	113.3	355	482	388	592	720	646	82.2	91.4
Netherlands . . . . .	191	142	135	134.4	141.1	3,761	3,634	3,023	6,268	6,056	6,037	103.5	103.8
Poland . . . . .	4,495	4,066	3,904	110.6	136.0	49,933	49,394	36,305	83,220	82,321	60,508	101.1	137.5
Portugal . . . . .	1,161	1,120	1,071	103.7	108.4	7,030	8,200	6,102	13,216	13,817	10,171	95.6	129.9
Rumania . . . . .	8,566	7,551	7,746	113.4	110.6	81,179	78,464	63,319	135,205	130,770	105,530	103.5	123.2
Sweden . . . . .	633	646	488	105.6	139.9	10,320	12,852	9,381	18,048	21,469	15,635	84.1	115.4
Switzerland (1) . . . . .	179	180	171	96.6	104.8	3,204	3,461	3,357	5,439	5,769	5,595	95.2	98.1
Czechoslovakia . . . . .	2,047	1,965	1,873	104.2	100.3	24,730	30,364	28,686	41,232	50,606	47,804	81.5	86.2
Yugoslavia . . . . .	5,390	5,365	4,708	100.5	114.5	59,274	48,197	48,593	98,789	80,326	80,983	123.0	122.0
Total Europe . . . . .	(§) 75,546	73,810	70,731	102.3	106.8	863,118	818,118	810,713	1,438,899	1,364,002	1,351,173	105.5	106.5
*U. S. S. R. . . . .	93,049	83,795	71,278	111.0	130.5	...	650,366	477,453	...	1,083,921	705,739	...	...
Canada . . . . .	26,115	24,398	23,104	104.0	113.0	182,488	252,403	258,428	304,144	420,672	430,704	72.3	70.6
United States . . . . .	54,949	61,138	57,692	89.9	95.2	535,363	514,896	493,690	892,271	858,160	822,704	104.0	108.4
Mexico . . . . .	1,424	1,216	1,261	117.1	113.0	9,497	6,868	6,450	15,778	11,446	10,780	137.8	146.6
Total North Amer. . . . .	82,488	87,252	82,057	94.5	100.5	727,316	774,107	758,570	1,212,162	1,290,278	1,264,258	93.9	95.9
China: Manchuria . . . . .	3,920	3,413	2,781	114.8	143.5	35,037	30,515	27,101	58,394	50,857	45,187	114.8	129.3
Korea . . . . .	...	848	890	...	...	5,370	5,391	5,905	9,951	8,985	9,312	99.6	95.8
India . . . . .	32,181	31,654	31,475	101.7	102.2	208,365	234,506	191,654	347,275	390,843	319,424	89.0	108.7
Japan . . . . .	1,231	1,198	1,174	102.7	104.9	18,536	17,723	17,817	30,892	29,538	29,095	104.6	104.0
Syria and Lebanon . . . . .	1,193	1,166	1,147	100.1	101.8	8,358	11,133	7,435	13,929	18,555	12,392	75.1	112.4
Total Asia . . . . .	(§) 39,543	33,279	37,417	102.8	105.2	275,666	299,268	249,612	459,441	498,773	416,020	92.1	110.4
Algeria . . . . .	3,640	4,027	3,654	90.4	99.6	15,390	19,464	17,790	25,649	32,439	29,640	79.1	86.5
*Cyrenaica . . . . .	18	38	33	46.2	53.2	...	93	119	...	155	198	...	...
Egypt . . . . .	1,649	1,522	1,554	108.4	106.1	27,643	23,852	24,030	46,071	39,753	40,040	115.9	115.0
Eritrea . . . . .	22	7	27	300.0	82.4	110	26	61	184	44	101	416.7	181.8
Kenya (2) . . . . .	59	71	57	83.7	104.3	253	389	358	422	648	597	65.1	70.6
French Morocco . . . . .	2,732	2,957	2,632	92.4	103.8	20,825	12,782	16,553	34,708	21,302	27,588	162.9	125.8
Tripolitania . . . . .	17	12	34	140.0	50.7	46	11	64	77	18	107	420.0	71.9
Tunisi . . . . .	1,927	1,923	1,719	100.3	112.1	8,378	6,239	7,088	13,962	10,398	11,780	134.3	118.5
Total Africa . . . . .	10,046	10,519	9,677	95.5	90.8	72,645	62,763	65,924	121,073	104,693	109,871	115.7	110.3
Argentina (3) . . . . .	17,295	21,293	20,484	81.3	84.4	131,175	141,578	145,819	218,621	235,958	243,026	92.7	90.9
*Chile . . . . .	1,429	1,610	1,602	88.6	89.0	...	12,714	17,255	...	21,190	28,758	...	...
Uruguay . . . . .	1,154	864	1,056	133.4	109.3	7,056	4,421	7,335	11,759	7,369	12,224	150.6	96.2
Un. of South Africa . . . . .	1,475	1,137	878	129.8	108.0	8,538	6,108	4,927	14,230	10,180	8,212	130.8	178.3
Australia . . . . .	13,990	13,212	12,797	76.8	109.3	105,000	127,059	81,605	175,000	213,266	136,006	82.1	128.7
*New Zealand . . . . .	276	243	227	113.6	121.8	...	3,900	4,582	...	6,500	7,687	...	...
Grand Totals . . . . .	(§) 241,342	251,386	233,101	96.0	102.7	2,190,514	2,234,682	2,124,510	3,650,316	3,124,433	3,540,790	98.0	108.1
RYE													
Germany . . . . .	10,789	11,642	11,614	92.7	92.9	147,269	169,297	167,462	262,982	302,317	299,040	87.0	87.9
Austria . . . . .	904	927	946	97.5	95.5	10,260	11,556	11,257	18,322	20,636	20,102	88.8	91.5
Belgium . . . . .	553	574	598	98.3	97.3	11,470	10,433	12,206	20,483	18,630	21,797	109.9	94.6
Bulgaria . . . . .	597	657	481	90.8	124.3	6,760	7,067	4,104	12,072	12,620	7,329	95.7	184.3
Denmark . . . . .	332	389	448	90.0	74.1	4,850	5,614	6,349	8,661	10,026	11,337	86.4	75.2
Spain . . . . .	1,516	1,551	1,717	97.8	88.3	10,387	12,064	13,854	18,512	21,544	23,547	85.9	75.7
Estonia . . . . .	356	387	354	97.0	100.4	3,259	4,975	3,325	5,820	8,885	6,937	65.5	85.5
Finland . . . . .	554	555	553	99.6	100.1	6,804	7,898	6,712	11,792	14,104	11,958	88.6	95.4
France . . . . .	1,775	1,845	1,953	98.2	90.9	17,388	15,900	19,963	31,018	28,394	35,548	109.2	87.4
Engl. and Wales . . . . .	33	32	28	103.6	115.4	...	470	489	...	840	785	...	...



COUNTRIES	(t) AREA					(t) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	
	—	—	—	1930	Aver.	—	—	—	—	—	—	1930	Aver.
	1931/32	1930/31	1925/26 to 1929/30	— 1930 1931	— 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	— 1930 1931	— 100
	1,000 acres					1,000 centals			1,000 bushels				
Greece . . . . .	...	157	121	...	...	1,016	1,028	868	1,815	1,837	1,549	98.8	117.1
Hungary . . . . .	1,484	1,611	1,649	92.1	90.0	12,082	15,907	16,836	21,575	28,406	30,064	76.0	71.8
Italy . . . . .	288	302	307	95.4	93.7	3,469	3,431	3,649	6,195	6,127	6,516	101.1	95.1
Latvia . . . . .	572	660	627	86.7	91.1	3,144	8,061	5,228	5,015	14,377	9,335	39.1	60.2
Lithuania . . . . .	1,257	1,197	1,192	105.0	105.4	9,118	14,090	11,412	16,282	25,177	20,379	64.7	79.9
Luxembourg . . . . .	10	22	17	73.7	95.3	188	269	206	336	480	367	70.0	91.5
Norway . . . . .	15	19	21	79.9	72.5	212	311	325	378	556	580	68.1	65.2
Netherlands . . . . .	444	475	489	93.3	90.8	7,350	8,340	8,860	13,125	14,892	15,832	88.1	82.9
Poland . . . . .	14,263	14,567	14,016	97.9	101.8	125,722	153,309	136,378	224,504	273,923	243,534	82.0	92.2
*Portugal . . . . .	593	406	488	146.2	121.4	...	2,744	2,464	...	4,901	4,401	...	...
Rumania . . . . .	1,006	908	720	104.0	139.8	7,818	10,241	5,971	13,982	18,288	10,662	76.3	130.9
Sweden . . . . .	511	595	741	85.9	69.0	6,577	10,083	10,981	11,745	18,005	19,609	65.2	59.9
Switzerland . . . . .	46	49	49	92.5	98.5	785	881	912	1,402	1,484	1,629	94.4	86.0
Czechoslovakia . . . . .	2,470	2,556	2,540	95.5	97.3	30,593	39,409	37,015	54,631	70,374	66,069	77.6	82.7
Yugoslavia . . . . .	923	626	531	99.6	117.4	4,264	4,382	4,148	7,614	7,825	7,407	97.3	102.8
Total Europe . . . . .	(§) 40,528	42,323	41,654	95.8	97.3	430,545	514,585	487,527	768,836	918,912	770,584	82.7	88.3
*U. S. S. R. . . . .	69,237	72,283	66,020	95.0	103.0	...	...	489,038	...	...	873,285	...	...
Canada . . . . .	778	1,448	794	53.7	97.9	2,980	12,330	7,245	5,322	22,018	12,937	24.2	41.1
United States . . . . .	3,143	3,543	3,546	88.7	88.6	18,388	25,412	25,053	32,746	45,879	44,737	72.2	73.2
Total North Amer. . . . .	3,921	4,991	4,340	73.6	90.4	21,318	37,742	32,298	38,068	67,397	57,674	56.6	66.0
Algeria . . . . .	3	5	3	73.6	104.7	20	38	23	37	69	41	53.4	89.1
Argentina (3) . . . . .	1,378	1,322	901	104.3	153.0	5,071	2,946	3,352	9,055	4,724	5,996	191.7	151.3
*Chili . . . . .	7	8	7	88.7	95.2	...	67	66	...	120	118	...	...
Grand Totals . . . . .	(§) 45,830	48,641	46,899	94.2	97.7	456,954	555,011	523,200	815,996	991,102	934,285	82.3	87.3

## BARLEY

Germany . . . . .	4,001	3,753	3,602	106.6	108.4	66,540	63,055	63,172	138,628	131,378	131,611	105.5	105.3
Austria . . . . .	422	430	371	98.1	113.8	5,119	5,893	5,237	10,665	12,278	10,911	86.9	97.7
Belgium . . . . .	70	84	77	83.2	91.3	1,705	1,836	1,804	3,552	3,825	3,947	92.9	90.0
Bulgaria . . . . .	607	692	562	87.7	108.0	7,949	9,537	5,858	16,599	19,899	12,204	83.3	135.7
Denmark . . . . .	889	928	826	95.3	107.6	21,385	23,170	19,940	44,653	43,272	41,542	92.3	107.2
Spain . . . . .	4,644	4,543	4,456	102.8	104.2	43,548	49,883	44,786	90,727	103,926	93,305	87.3	97.2
Estonia . . . . .	279	276	235	100.9	98.0	2,840	2,829	2,454	5,918	5,808	5,112	100.4	115.8
*Irish Free State . . . . .	115	116	131	99.0	87.9	...	2,648	3,001	...	5,517	6,253	...	...
Finland . . . . .	276	272	273	101.4	100.8	3,086	2,987	3,114	6,430	6,223	6,487	103.8	99.1
France . . . . .	1,960	1,842	1,776	106.4	110.3	26,307	20,379	24,356	54,807	42,457	50,742	129.1	108.0
Great Britain . . . . .	1,118	1,129	1,287	99.1	86.9	18,980	18,679	23,997	30,548	38,914	49,905	101.6	79.1
Greece . . . . .	...	534	453	...	...	4,408	3,759	3,249	9,172	7,831	6,768	117.1	135.5
Hungary . . . . .	1,164	1,131	1,094	102.9	110.4	10,249	13,250	13,118	21,352	27,605	27,330	77.3	78.1
Italy . . . . .	530	583	577	90.8	91.8	5,289	5,377	5,416	11,020	11,802	11,285	98.4	97.7
Latvia . . . . .	458	437	430	103.6	104.0	4,225	4,130	3,420	8,509	8,605	7,126	102.4	123.6
Lithuania . . . . .	474	529	494	89.6	95.9	5,205	5,224	4,831	10,845	10,884	10,655	99.6	107.7
Luxembourg . . . . .	11	7	8	148.3	130.2	128	99	112	266	206	233	129.1	113.9
Malta (4) . . . . .	7	7	6	101.4	106.0	137	142	138	285	295	288	96.8	99.0
Norway . . . . .	138	134	143	102.8	97.1	2,019	2,862	2,866	4,207	4,922	4,929	85.5	85.3
Netherlands . . . . .	70	76	71	92.8	99.3	1,764	1,939	1,916	3,674	4,040	3,992	91.0	98.0
Poland . . . . .	3,144	3,048	2,841	102.6	110.1	32,534	32,274	30,787	67,781	67,238	64,090	100.8	105.7
*Portugal . . . . .	148	171	181	89.9	81.8	...	1,186	870	...	2,367	1,813	...	...
Rumania . . . . .	4,742	4,881	4,360	97.2	103.8	51,182	52,279	36,233	64,084	108,916	75,487	59.6	86.1
Sweden . . . . .	311	326	348	95.3	89.3	5,145	5,290	5,719	10,716	11,021	11,916	97.2	89.9
Switzerland . . . . .	18	16	16	109.2	110.1	271	238	267	655	496	566	113.9	101.6
Czechoslovakia . . . . .	1,775	1,687	1,770	106.4	100.3	23,691	26,848	23,597	49,857	55,984	50,579	88.2	82.3
Yugoslavia . . . . .	1,105	1,133	976	97.6	113.3	8,640	8,915	8,342	18,000	18,574	17,879	96.9	103.6
Total Europe . . . . .	(§) 28,742	28,458	27,158	101.0	105.3	332,342	360,377	339,299	692,396	750,799	706,383	92.2	95.0
*U. S. S. R. . . . .	16,905	18,417	17,724	92.1	95.7	...	...	124,687	...	...	259,770	...	...
Canada . . . . .	3,768	5,559	4,297	67.8	87.7	32,343	64,377	50,183	97,382	135,160	104,550	49.9	64.4
United States . . . . .	11,471	12,662	10,818	90.8	111.2	95,503	146,208	125,026	198,965	304,601	260,476	65.3	76.4
Total North Amer. . . . .	15,239	18,221	14,610	89.6	104.3	127,846	210,585	175,209	296,347	439,761	365,026	60.6	73.0
Korea . . . . .	...	2,382	2,209	...	...	19,621	19,127	17,666	40,377	39,849	36,805	102.6	111.1
Japan . . . . .	2,105	2,110	2,338	99.8	90.1	36,780	34,736	40,996	76,522	72,472	84,785	105.6	90.3
Siam and Lebanon . . . . .	941	881	706	113.2	133.4	6,812	10,858	6,748	14,193	22,621	14,055	62.7	101.0
Total Asia . . . . .	(§) 5,422	5,323	5,254	102.0	103.4	63,163	64,771	66,108	131,692	134,949	135,646	97.5	97.0

COUNTRIES	(t) AREA					(t) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	
	—	—	—	1930	Aver.	—	—	—	—	—	—	1930	Aver.
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	= 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	= 100
	1,000 acres					1,000 centals			1,000 bushels				
Algeria . . . . .	3,178	3,075	3,445	86.5	92.2	12,903	18,327	16,661	27,009	38,183	34,712	70.9	78.0
*Cyrenaica . . . . .	82	127	133	64.5	61.3	...	276	772	...	574	1,609	...	...
Egypt . . . . .	306	345	368	88.7	83.0	4,653	5,043	5,440	9,693	10,506	11,334	92.3	85.5
Eritrea . . . . .	62	47	58	131.6	105.9	...	320	207	166	666	432	346	154.3
French Morocco . . . . .	3,156	3,207	3,028	98.4	104.2	24,643	17,905	21,933	51,341	37,491	45,695	136.9	112.4
Tripolitania . . . . .	99	124	274	80.0	36.0	...	265	165	609	551	344	1,268	100.0
Tunis . . . . .	1,087	1,202	1,243	90.4	87.5	3,968	2,646	4,195	8,268	5,512	8,741	150.0	94.6
Total Africa . . . . .	7,888	8,600	8,416	91.7	93.7	46,842	44,343	49,004	97,588	92,168	102,096	105.5	95.6
Argentina (3) . . . . .	1,489	1,422	1,171	101.2	122.8	9,039	6,834	7,961	18,832	14,238	16,587	132.3	113.6
*Chili . . . . .	144	166	173	86.9	83.4	...	1,860	2,681	...	3,876	5,555	...	...
Uruguay . . . . .	10	15	8	66.1	123.3	76	62	64	157	130	133	121.3	118.4
*Un. of South Africa . . . . .	76	70	80	107.8	95.3	...	502	621	...	1,046	1,298	...	...
*New Zealand . . . . .	24	25	23	95.0	102.6	...	397	456	...	828	953	...	...
Grand Totals . . . . .	(§) 58,746	62,039	56,614	94.7	103.8	379,308	687,512	636,645	1,206,912	1,432,338	1,326,375	84.3	91.0
OATS													
Germany . . . . .	8,309	8,499	8,640	97.8	96.2	136,795	124,702	143,803	427,482	389,690	449,664	109.7	95.5
Austria . . . . .	720	772	757	98.3	95.2	7,346	8,834	9,501	22,956	27,606	29,972	88.2	76.6
Belgium . . . . .	729	674	678	108.1	107.5	15,483	12,231	15,318	48,384	38,223	47,890	126.6	101.1
Bulgaria . . . . .	205	345	338	85.6	87.4	2,734	2,437	2,332	8,005	7,016	7,287	113.0	113.1
Denmark . . . . .	388	958	1,028	97.9	91.2	20,724	21,992	21,201	64,761	68,725	66,254	94.2	97.7
Spain . . . . .	1,986	1,940	1,873	102.3	106.0	13,335	15,900	12,013	41,670	40,995	40,854	83.3	108.3
Estonia . . . . .	367	368	357	99.6	102.7	3,615	3,478	2,670	11,206	10,870	8,343	108.9	136.4
*Irish Free State . . . . .	628	644	656	97.5	95.8	...	14,160	14,419	...	44,250	45,000	...	...
Finland . . . . .	1,149	1,137	1,098	101.1	104.7	14,884	13,267	12,775	45,886	41,458	39,922	110.7	114.9
France . . . . .	8,638	8,460	8,598	102.1	100.5	110,152	91,506	111,902	344,222	285,955	349,690	120.4	98.4
Great Britain . . . . .	2,772	2,047	3,040	94.1	91.2	46,771	50,738	54,381	149,158	153,556	169,940	92.2	86.0
Greece . . . . .	...	336	282	...	...	2,116	1,885	1,568	6,614	5,801	4,900	112.3	136.0
Hungary . . . . .	596	1,608	687	98.0	86.7	4,044	5,760	8,235	12,630	17,909	25,734	70.2	49.1
Italy . . . . .	1,222	962	1,243	90.0	98.3	13,331	11,785	13,798	41,658	36,828	43,103	118.1	96.6
Latvia . . . . .	795	790	740	100.6	107.5	7,555	7,582	5,480	23,611	23,587	17,124	100.3	137.9
Lithuania . . . . .	900	855	828	105.3	108.7	8,981	8,590	6,846	28,065	26,371	21,304	104.4	131.2
Luxemburg . . . . .	75	70	72	106.4	103.8	871	880	971	2,721	2,750	3,035	90.0	89.7
Norway . . . . .	237	289	241	99.0	98.2	3,088	4,359	4,024	9,494	13,621	12,574	69.7	75.5
Netherlands . . . . .	366	370	377	99.0	97.1	6,067	6,545	7,332	18,960	20,454	22,913	92.7	76.7
Poland . . . . .	5,367	5,404	5,007	99.3	107.2	50,915	51,766	51,251	159,109	161,738	160,159	98.4	99.3
*Portugal . . . . .	371	429	478	88.5	77.9	...	2,489	1,740	...	7,778	5,436	...	...
Rumania . . . . .	2,154	2,686	2,806	80.2	76.8	14,776	25,497	22,518	46,175	79,679	70,368	58.0	66.6
Sweden . . . . .	1,590	1,629	1,763	97.7	90.2	22,326	25,269	26,111	69,767	79,058	81,595	88.2	85.5
Switzerland . . . . .	45	48	50	93.9	90.6	739	851	928	2,308	2,659	2,900	86.8	79.6
Czechoslovakia . . . . .	2,031	2,035	2,086	99.8	97.4	26,908	28,833	30,997	84,368	90,101	96,885	98.6	87.1
Yugoslavia . . . . .	979	1,037	936	94.4	104.6	5,837	6,283	7,548	18,242	19,634	23,586	92.9	77.3
Total Europe . . . . .	(§) 42,596	43,469	43,505	98.0	97.9	539,253	531,048	574,578	1,686,148	1,669,514	1,795,545	101.5	93.9
*U. S. S. R. . . . .	43,249	44,267	41,262	97.7	104.8	...	...	326,482	...	...	1,020,185	...	...
Canada . . . . .	12,871	13,259	12,831	97.1	100.3	111,615	143,870	133,308	348,795	449,595	416,583	77.6	83.7
United States . . . . .	39,722	39,729	42,175	100.0	94.2	355,885	408,884	414,391	1,112,142	1,277,704	1,294,962	87.0	86.9
Total North Amer. . . . .	52,593	52,988	55,006	99.3	96.6	467,500	552,754	547,699	1,460,937	1,727,359	1,711,545	84.6	86.4
Syria and Lebanon . . . . .	27	28	41	98.5	66.8	182	175	282	570	547	880	104.2	64.7
Algeria . . . . .	557	685	805	87.8	92.2	2,628	5,300	4,118	8,212	16,561	12,869	49.6	68.8
French Morocco . . . . .	73	103	71	71.6	103.9	755	754	559	2,359	2,357	1,747	100.1	136.0
Tunis . . . . .	99	124	104	79.6	94.7	1,036	661	825	3,238	2,067	2,577	156.7	126.7
Total Africa . . . . .	729	862	780	84.8	93.7	4,419	6,716	5,502	13,809	20,985	17,193	65.8	80.3
Argentina (3) . . . . .	3,470	3,937	3,387	88.1	102.5	20,944	15,873	21,278	65,449	49,604	66,498	131.9	98.4
*Chili . . . . .	136	193	193	81.0	80.9	...	1,635	2,199	...	5,109	6,870	...	...
Uruguay . . . . .	152	179	150	85.2	101.8	1,002	440	860	3,132	1,376	2,716	227.6	116.3
*Un. of South Africa . . . . .	578	535	618	107.9	93.5	...	1,894	2,282	...	5,920	7,131	...	...
*New Zealand . . . . .	329	322	320	102.2	102.9	...	1,381	1,485	...	4,314	4,639	...	...
Grand Totals . . . . .	(§) 93,567	101,463	102,869	98.1	96.8	1,033,300	1,107,005	1,150,208	3,229,045	3,459,385	3,594,372	93.3	89.3

(t) The two dates mentioned refer to the years in which the harvest took place in the northern and southern hemispheres respectively. — \* Countries not included in the totals. — (§) For the few countries for which figures are still lacking the data of area in 1930 have been assumed. — (x) Including spelt and meslin. — (a) European crops only. — (3) Area sown. — (4) Barley and meslin.

Sowings of winter oats have increased regularly in the last ten years and this year reached a record for the post-war period. Sowings of winter barley are normal but those of rye and meslin show a tendency to diminish; the area sown to meslin was 177,000 acres or about the same as in the previous year (176,000 acres, 101.0 %) but considerably less than the average for 1926-30 (198,000 acres, 89.7 %).

The area sown to wheat as on January 1, which has decreased uninterruptedly since 1927, is little below the five-year average of 1923-1927 which may be considered as normal.

These comparisons are not, however, absolute. An examination of the statistical series for the period 1921-1930 reveals relatively large differences between the preliminary estimates of January 1 and those of May 1, sometimes positive, sometimes negative. From 1921 to 1925 inclusive, sowings effected during January were fairly large and losses by bad weather relatively small; from 1926 to 1929 the opposite occurred with the result that during the first period the estimates of May 1 exceeded those of January 1 whereas in the latter period they were smaller; in 1930 they were again superior.

It must be noted, moreover, that these differences are sometimes normal statistical errors.

Consequently a simple examination of the estimate of sowings on January 1, 1932 can give only a very approximate idea of the area sown to winter wheat in comparison with other years. General information indicates that owing to very favourable conditions in January for field work and sowing, a rather large area could be sown and the total winter sowings reached 13.1-13.3 million acres; whatever the weather conditions may be later the wheat area to be harvested can hardly fall below 12.8 million acres and will consequently be about 10 % larger than in the previous year and nearly normal if the period 1921-25 is taken to represent the latter.

As regards the situation of the crops already sown, January weather was on the whole mild and rather fine. Towards the end of the month the weather turned cold and drier to the great benefit of the crops which were infected with weeds and in many regions by rodents. At the beginning of February a period of intense cold set in with severe frosts in most regions.

The frost does not appear to have seriously damaged the cereals sown although the first sowings were forward in growth and in some cases luxuriant and in some regions not all the fields had a snow cover. The freezing of the damp soil moreover, caused danger of heaving. At the beginning of February, however, the appearance of the crops was everywhere good. Despite the apparently favourable conditions it must be noted that the abnormal mildness of temperatures in January and especially the fairly pronounced wetness of the autumn and the first few months of the winter were not very favourable for cereals. Work preparatory to the spring sowings is proceeding under excellent conditions.

*Great Britain and Northern Ireland* : Mild weather in January favoured the growth of winter-sown crops and their condition at the end of the month was satisfactory. Weather was generally suitable for outdoor work but, while in Scotland and Northern Ireland this work was well advanced, in England and Wales it was hindered by the wet condition of the land.

*Hungary* : In the period from 9 December 1931 to 15 January 1932 the weather was characterised by a generally normal temperature and little precipitation. From the beginning of this period until 30 December snow never covered the whole country, but on 30 December, 3 January and 7-8 January the whole territory had a snow-cover, though generally a light one. At the end of the period the snow had again melted in the greater part of the country. Winter sowings were vigorously developed at the beginning of the winter.

(Telegram of 22 February): A great lack of rains has been reported and an insufficiency of snow cover. Sowings of winter cereals have suffered greatly from frosts.

*Italy* : Temperatures during January were on the whole some degrees above the normal; there were frequent white frosts; rains were particularly heavy in the period January 10 to 20. Wheat sowings are in general in good condition; seasonal field work was begun and continued actively. In some provinces sowing of spring wheat was begun.

*Latvia* : In January temperatures were exceptionally high for the time of year, 3.5° to 5°C above normal being registered. Precipitation was generally abundant save in the south and west. At the beginning of January there was a snowstorm, followed by rain. The snow cover had already disappeared at the beginning of the month save in the western districts where it remained until the middle of the month.

*Lithuania* : Until February the weather was unfavourable to winter crops. Though there were no severe frosts in December or January the fields have had no protective snow cover. Snow did not fall until the beginning of February.

*Norway* : According to the final estimates, the 1931 crop of meslin was 179,000 centals (308,000 bushels) against 255,000 (400,000) in 1930 and 297,000 (511,000) in the five years ending 1929; 70 % and 60 %.

*Poland* : In general the winter has not been severe. Temperatures, though instable have been to a large extent above the multi-annual average. The lack of snow cover gives rise to fears that winter sowings will suffer losses from frost; their crop condition is better in Poznań and Pomerania.

*Portugal* : Sowings of winter cereals have been made in excellent conditions, especially at the beginning of autumn, when they were favoured by the rains. Late sowings, in November, were affected by prolonged drought, which severely affected germination and made resowings necessary, especially in some southern districts.

Work for spring sowings has been rendered difficult by the dryness of the soil, though the recent rains improved the condition of the latter.

*Rumania* : In the latter half of January, the average temperature rose slightly except in the plateaux of Transylvania where it touched — 10.8 C with a minimum of — 19°C. Relatively little snow fell. As weather conditions were on the whole favourable at the beginning of February the condition of autumn sowings was excellent. In Bessarabia, Bukovina, Moldavia and the Carpathian regions of Muntenia, the crops had a good snow cover. In the Danube valley, the snow had melted in places. Up to February 1 the crops had not been damaged by frost.

*Yugoslavia* : January was generally cold and fine. Sowings, though exposed, did not suffer from the cold, which was generally less intense.

*U. S. S. R.* : According to the information communicated to the Institute by the People's Commissariat for Agriculture the total area sown to winter cereals in autumn 1931 was 1.3 % below that of 1930. Sowings were carried out under rather poor conditions but germination was regular. Up to the end of January the weather was very mild. The very deep snow-cover formed toward the middle of December disappeared almost completely in many areas toward the beginning of January thanks to the mild weather that supervened. Toward 20 January in Ukraina and in some central districts of the Northern Caucasus the fields were almost completely devoid of snow. Subsequently snow fell in various areas and toward the end of the first decade of February the snow-

cover was sufficient to protect sowings in almost all districts. In some regions an ice-crust formed but information is not yet available as to the area afflicted or the effects on sowings.

According to the programme set up by the Government the areas to be sown this spring to the principal cereals in comparison with those in spring 1931 are as follows in thousands of acres :

	1932	1931
Wheat . . . . .	64,743	63,562
Oats. . . . .	44,974	43,249
Barley . . . . .	17,298	16,097
Maize. . . . .	10,554	9,800

*Argentina* : Quality this year is excellent. By a recent decree the Banco de la Nación has granted growers special credits of 150 days duration at an annual interest of 6.5%. The Banco will hold a mortgage on the produce.

*Canada* : For the five month period August to December 1931, 75.61 % of inspections graded No. 3 Northern or better as compared with 70.47 % in the corresponding period in 1930. This statement must be qualified by noting that only 29.28 % of the cars grading No. 3 Northern or better were No. 1 Northern in August to December, 1931, compared with 49.63 % in the same class in 1930, while 45.88 % graded No. 2 Northern in 1931 compared with only 32.33 % in 1930.

The final estimate of the area under mixed grains in Canada in 1931 is 1,187,000 acres compared with 1,201,000 in 1930 and 1,009,000, the average for 1925-29 ; percentages : 98.2 and 117.6. Production amounted to 17,744,000 centals against 19,924,000 and 16,154,000 respectively ; percentages : 89.1 and 109.8.

*United States* : In the week ended on January 27 the continued mild weather caused wheat to remain green and in danger of injury from frost ; in central sections the soft and muddy state of the fields prevented much grazing. There occurred some damage by heaving in the Ohio valley and by freezing and thawing in the southwestern part of the main belt. Snow cover remained over the more northern portions, although diminished in parts but in the Pacific Northwest considerable wheat land was bare. There was no extensive injury in the latter section, despite freezing nights. In the following week ended on February 3 weather was cold in the winter wheat belt and the crop was forward for the season ; only slight damage was reported. According to a telegram dated February 11, the crop condition of winter wheat was generally good. A later telegram of February 17 states that the crop condition of winter wheat remains unchanged from the previous week.

On February 24 crop condition of winter wheat was generally satisfactory but the snow cover was disappearing.

*Mexico* : Sowings of winter crops have been made under good conditions.

In the principal producing areas the crops have made rapid progress. At the beginning of January, thanks to favourable precipitation, an improvement in crop condition was reported. Frosts, at least in December, caused very little damage.

*India* : In the second week of January light rain fell in most districts of the Punjab except Rohtak and Gurgaon, the maximum being 2.87 inches and the minimum 0.03 inches. As a result of this rain condition remained average to good until nearly the end of the month but on February 16 despite slight rainfall toward the middle of the month rain was again badly needed and condition on unirrigated areas was below the average to average whereas on irrigated areas it remained unchanged. In the first week of

February insects caused some damage in the district of Manwali. In the United Provinces practically no rain fell during the month and moisture was badly needed, especially in unirrigated areas where some withering was noted. Local damage was caused by rats and white ants during the month. Crop prospects on February 15 were fair except in unirrigated areas. Weather in the Central Provinces was mostly clear during the month and rain was needed in some districts. Rats caused some damage in Buldana and Akola and wheat on light lands was withered due to lack of rain. On February 15 condition was good but the crops needed rain.

According to a telegram of February 22 from the Government of the Punjab, the area sown to wheat is 10,918,000 acres or only slightly larger than the corresponding figure of 10,866,000 acres in 1930-31 and 2.4 % above the average of 1925-26 to 1929-30 (10,658,000 acres). Crop condition is the same as at this period last year, namely, 90 % of normal.

*Japan.* (Telegram of 20 February) : Favoured by the weather wheat and barley have developed regularly and uniformly.

*Palestine* : Sowings have been effected under average conditions. Climatic conditions were unfavourable during December and some frosts were recorded. Rainfall has been below the average and very local in character, and in some areas crops are suffering from drought.

Light showers on the coastal plains and in the northern areas have kept the *afir* sown crops developing, and aided regular and uniform germination the winter sown cereal crops. The absence of heavy rains has given rise to conditions favourable to the breeding of field mice and a very serious increase in this pest must be recorded. *Afir* wheat and barley are good in Beersheba, Gaza and Hebron and are developing nicely in the northern areas and the coastal plains ; other areas need rain. Ploughing and sowing of winter wheat are in progress. Sowing of winter barley is concluded, with the exception of the hill areas ; germination has been good, but rain is needed in some districts. Sowing of oats is concluded.

*Syria and Lebanon* : No information on the area of sowings in Syria has yet been received but it is known that conditions were good. Rainfall towards the end of November and the beginning of December assured good germination. Weather conditions were normal and no frost occurred until January. In Lebanon the area of sowings is about equal to that of last year. Sowing was effected late and under rather average conditions ; germination is irregular. In the government of Latakia (Alouites) the area of sowings is little smaller than last year. Sowing was effected under good conditions and germination was regular and uniform. Weather conditions have been normal. In the Djebel-Druze area wheat and barley sowings were effected under average conditions and germination was fairly uniform. Weather conditions have been favourable.

*Algeria* : January was on the whole characterised by fine weather despite some brief rains ; a period of cold weather at the beginning of the month, moreover, helped to clean the land. These particularly favourable conditions permitted the active progress of sowings which were greatly in delay at the end of the preceding month. A considerable acreage was sown during January, exceeding by a wide margin sowings effected in the same period of previous years. A comparison of the figures for January 1 and February 1 show that there has never been sown in the month of January more than 741,000 acres of wheat, even in the years in which sowings at the end of December were particularly backward and January conditions were propitious ; this year sowings in January covered 1,161,000 acres or nearly one-third of the total acreage sown. Barley sowings in January cover the smaller area of 840,000 acres and did not suffice.

to make up for the delay as at the end of December, although they were larger than in any previous year.

Account must be taken, however of certain differences in the dates of estimation which may have some influence on the comparability of the figures.

At the end of January, it may be considered, sowing was finished : normally sowings effected between this date and the end of February do not exceed 124,000 acres for wheat and 74,000 acres for barley. According to the figures given above it appears, therefore, that wheat sowings this year will not only be much larger than those of last year which were diminished by particularly unfavourable conditions, but also much larger than those of all years back to 1924, including the exceptional year 1930.

It must, however, be noted that the estimates made in February-March give only a very approximate indication of the areas actually cultivated ; the final estimates have, in fact, exceeded those of February by nearly 500,000 acres in the last three years ; by nearly 250,000 in 1928 and 1926, and by nearly 125,000 in 1927 without counting the difference for 1925 which amounted to nearly 750,000 acres.

For barley these differences are not so large and have rarely reached 250,000 acres except in 1925 when there was an abnormal difference for this cereal also.

These considerations permit the forecast that the area sown to wheat this year will, according to the final estimate, exceed 3,700,000 acres and will at the least equal those of 1929 although it cannot be foreseen whether the large acreage of 1930 will be reached or not. For barley, on the contrary, the area sown seems to be larger only than that of last year and below those of previous years. There has consequently occurred an extension of wheat growing at the expense of barley. The total area of cereals including oats and rye is normal with an area of 7,255,000 acres on February 1, 1932, exceeding that of last year (6,447,000 acres) by nearly 750,000 acres, but nearly equal to the average of 1926-30 (7,308,000 acres).

The sowings were favoured by weather conditions in January, mild temperatures following a short period of intense cold, and good sunshine ; the soil is sufficiently moist. Sprouting is regular. It is feared, however, that the lateness with which many sowings were effected will unfavourably influence yields.

*Cyrenaica* : The season has been extremely dry. Sowings were difficult and germination took place under bad conditions. It is feared that the crop will be completely compromised save in the eastern part of the colony, where, however, sowings have only a limited extension.

*Egypt* : The weather was fair at the beginning of January, but turned much colder, especially during the night, and the excessive cold retarded the growth of the wheat. The frost had a bad effect on late-sown areas, especially on weak lands, but the rain brought about a revival. Some farmers, relying on atmospheric humidity and rain, which fell occasionally in Lower Egypt and in the provinces of Giza and Fayum, and on artesian water in Upper Egypt, continued the manuring of areas which had not been manured before the irrigation canals were closed, on December 25, owing to the winter closure. Ears have started to form in some early sown areas in certain localities. Weather conditions have been favourable to the growth of barley. The rain which fell during the last week of the month was beneficial to the crop, especially at Mariout. Ear formation started in some early-sown areas in the northern Delta and in Beni-Suef and Assyut provinces.

Crop condition of wheat on 1 February was 100 against 100 on 1 January 1932 and 1 February 1931. For barley the figures are the same.

*Kenya* : Weather conditions in December were generally favourable. Toward the end of the month harvesting of wheat was well advanced in many areas. The crop estimate has again declined owing to locust damage. Rust, frost and birds are also reported to have caused some damage locally.

*French Morocco* : Rains fell over the whole country toward the middle of January and restored the condition of sowings, which were beginning to suffer from the drought. The moisture was, however, insufficient in the south in the plain of Marrakesh.

*Tunis* : In the North, the principal cereal producing region, sowings have been carried out under average to fairly good conditions ; germination has been more or less regular according to district. In the Centre and South the condition of sowings was good and sprouting fairly regular.

*Union of South Africa* : In December the reaping of winter cereals continued to make satisfactory progress and record crops had been gathered in the eastern portion of the Western Province in the highveld areas of the Eastern Province and in the districts of the Orange Free State bordering Basutoland. Yields in other areas, however, were further reduced by the intense heat and drought.

## MAIZE

*Argentina*. (Telegram of February 2) : The crop situation is mediocre. In some districts locusts and lack of rain have caused important damage, reducing the area to be harvested. It is in general anticipated that this year's crop will be smaller than the record one of last season which reached 231,707,000 centals (413,763,000 bushels). According to a telegram from the Ministry of Agriculture of Argentina, the proportion of the crop still available on February 26 for export was about 12,346,000 centals (22,046,000 bushels). (Telegram of 19 February) : It is confirmed that this year's maize crop is estimated to be considerably smaller than that of last year.

*Palestine* : The first ploughing of maize is in progress in parts of Southern Palestine.

*French West Africa* : The maize crop was good in Dahomey, the principal centre of production, in Senegal, Guinea and the Ivory Coast ; due to the inadequacy of winter rains and particularly to the August drought it was deficient in the Upper Volta which is the second centre of production of French West Africa. The crop therefore seems to be normal or above it. Crickets have caused only small damage this year in these colonies.

*Egypt* : All areas under nili maize have now been harvested and the yield per acre is average.

*Kenya* : Weather conditions in December were on the whole favourable. During the month harvesting was nearly completed. Locust damage in some areas has slightly reduced the crop estimate.



Maize.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931	1931	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931	1931
	—	—	—	—	1931/32	—	—	—	—	—	—	—	1931/32
	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Aver. 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Aver 1931 = 100
	1,000 acres					1,000 centals			1,000 bushels of 56 lbs				
Austria . . .	148	143	146	108.9	101.7	8,314	2,663	2,490	5,917	4,766	4,447	124.4	133.1
Bulgaria . . .	1,676	1,689	1,671	99.2	100.3	21,983	17,088	14,713	39,256	30,515	26,274	128.6	149.4
Spain . . . .	1,053	1,106	1,057	95.2	99.6	14,778	16,152	13,144	29,389	28,844	23,471	91.5	112.4
France . . . .	833	833	843	99.9	98.2	13,246	12,532	9,428	23,654	22,379	16,537	105.7	140.5
Hungary . . .	2,735	2,605	2,682	105.0	102.8	32,258	31,021	39,546	57,605	55,394	70,618	104.0	81.6
Italy . . . . (s)	3,426	3,490	3,541	98.1	96.7	41,519	62,832	51,754	74,142	112,200	92,418	66.1	80.2
Poland . . . . (s)	238	255	213	93.4	109.3	2,266	3,008	2,013	4,046	5,362	3,595	75.5	112.6
Portugal . . .	243	233	217	104.2	111.6	2,296	1,847	1,940	3,299	3,464	124.3	118.3	...
Rumania . . .	865	868	827	99.6	104.6	...	9,364	7,950	...	16,732	14,196	...	...
Switzerland . .	11,749	10,939	10,606	107.4	110.8	140,214	99,648	99,979	250,384	177,942	178,534	140.7	140.2
Czechoslov. . .	8	3	3	79.2	76.4	64	64	84	114	114	150	100.0	75.9
Yugoslavia . .	344	360	343	95.6	100.5	5,020	5,479	5,363	8,965	9,783	9,577	91.6	93.6
Total Europe .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	126,688	136,395	120,279	92.6	105.3
*U. S. S. R. . .	28,606	27,753	26,387	103.1	106.4	347,903	328,710	307,310	621,350	536,983	549,664	105.8	113.0
Canada . . . .	9,801	9,684	8,386	101.2	116.0	...	...	79,114	...	...	141,275	...	...
United States .	131	161	174	81.2	75.2	3,030	3,263	3,703	5,426	826	6,613	93.1	82.1
Mexico . . . .	104,970	100,743	99,580	104.2	105.4	1,481,843	1,153,704	1,537,197	2,556,863	2,060,185	2,745,001	124.1	98.1
Tot. N. Amer. .	7,939	7,599	7,709	101.5	103.0	42,530	30,353	44,001	75,962	54,201	78,574	140.1	96.7
China: Manchuria .	113,040	108,503	107,443	104.2	105.2	1,477,421	1,187,320	1,581,901	2,638,251	2,130,212	2,830,188	124.4	93.2
Syria and Leb. .	2,441	2,139	2,469	114.1	98.9	37,754	35,080	37,848	67,418	62,554	67,586	107.8	99.8
Algeria . . . .	87	61	121	109.7	55.2	770	600	1,370	1,376	1,071	2,446	128.5	56.2
Eritrea . . . .	24	24	25	90.2	97.0	133	164	144	238	292	257	81.3	92.7
Kenya (1) . . .	22	22	13	100.0	166.7	132	198	79	238	354	142	66.7	166.7
Fr. Morocco . .	196	206	201	94.9	97.6	2,014	3,299	2,475	3,597	5,892	4,420	61.1	81.4
It. Somaliland .	837	649	561	129.0	149.3	2,080	3,354	2,973	3,715	5,990	5,809	62.0	70.0
Tunis (2) . . .	28	40	39	70.6	72.9	301	530	426	537	946	760	56.8	70.7
Total Africa . .	44	37	45	119.0	99.2	110	132	108	197	236	192	83.8	102.5
*Argentina . . .	1,151	978	884	117.4	130.5	4,770	7,677	6,205	8,520	13,710	11,780	62.1	76.9
*Chili . . . . .	14,468	13,776	11,549	105.0	125.3	...	231,707	163,577	...	413,763	292,103	...	...
Madagascar . .	89	92	88	96.7	101.0	...	1,516	1,229	...	2,707	2,194	...	...
Grand Total . .	227	220	207	90.2	110.0	2,028	1,623	2,302	3,622	2,898	4,111	125.0	88.1
	145,532	139,663	138,011	104.2	105.5	1,370,646	1,560,960	1,940,436	3,340,446	2,787,423	3,465,075	119.8	96.4

\* Countries not included in the totals. — s) Late crop (« maggengo »). — t) Early crop (« cinquantino »). — (1) European crop. — 2) Maize and sorghum.

*Union of South Africa:* The beneficial effects of the excellent rainfall during November were largely dissipated by the drought and exceptional heat in December. Fortunately, intermittent and light showers occurred in the highveld areas of the Transvaal and Orange Free State and the crop continued to make fairly satisfactory progress. In other areas, however, particularly in the Eastern Cape Province and Natal the intense heat scorched the young plants. Heavy rains and floods were reported at the close of the year; the drought, however, was not broken and up to the beginning of the third decade of January was still continuing in the principal producing areas. General prospects were unfavourable for a successful season.

## RICE

*Dominican Republic* : According to information published by the press of the Republic rice production in 1931 is estimated at 300,000 centals (750,000 bushels of 45 lbs). No comparable data are available for previous years but it is known that production this season has been particularly abundant.

*India* : In the third week of January the reaping of winter paddy in Bengal was completed and threshing was progressing. At the end of the month progress was being made with the preparation of land for paddy and transplanting of summer rice continued. On February 10 condition of standing crops was fair though some rain was needed in districts of West and North Bengal.

*Rice.*

COUNTRIES	AREA					PRODUCTION										
	1931/32	1930/31	Aver. 1925/26 to 1929/30		% 1931/32 1930/ 1931 = 100	Aver- age = 100	1931/32	1930/31	Aver. 1925/26 to 1929/30		1931/32	1930/31	Aver. 1925/26 to 1929/30		% 1931/32 1930/ 1931 = 100	Aver- age = 100
			1929/30	1930/ 1931					1929/30	1930/ 1931			1929/30	1930/ 1931		
1,000 acres			1,000 centals			1,000 bushels of 45 lbs.										
Bulgaria. .	14	17	18	84.7	78.7	290	366	329	645	814	730	79.3	88.4			
Spain . . .	113	120	121	94.2	93.6	5,869	6,892	6,743	13,042	15,316	14,985	85.2	87.0			
Italy . . .	346	361	349	96.0	99.3	13,918	14,333	14,652	30,928	31,850	32,559	97.1	95.0			
*Portugal. .	87	36	30	101.7	123.4	...	546	437	...	1,212	972	...	...			
*U. S. S. R. .	337	390	533	86.3	63.2	—	—	—	—	—	—	—	—			
Unit. States	970	959	948	101.1	102.3	20,256	19,935	18,408	45,014	44,299	40,903	101.6	110.0			
China: Man- churia . .	495	510	522	97.0	94.8	7,002	8,883	8,781	15,560	15,296	15,069	101.7	103.3			
Formosa { a)	677	660	615	102.7	110.1	14,474	13,892	12,208	32,164	30,871	27,128	104.2	118.0			
{ b)	888	858	797	103.5	111.5	16,080	15,500	13,971	37,086	34,444	31,046	107.7	119.5			
Korea . . .	3,869	3,970	3,885	99.8	102.0	63,437	76,746	69,472	140,968	170,543	132,158	82.7	106.7			
India . . .	84,034	82,706	80,758	101.6	104.1	1,130,438	1,110,706	1,047,336	2,512,033	2,468,186	2,327,368	101.8	107.0			
Japan . . .	7,952	7,988	7,787	100.2	102.1	219,386	266,620	237,020	487,514	592,477	526,700	82.3	92.6			
Siam (x) . .	(2) 3,877	(2) 4,084	(2) 3,548	91.1	103.8	49,601	58,018	54,454	110,222	128,925	121,007	85.5	91.1			
Java and S Madura { t	7,593	7,735	7,391	98.2	102.7	103,838	108,312	104,753	230,747	240,688	232,779	95.9	99.1			
{ t	1,086	1,077	1,101	100.8	98.6	9,259	10,309	9,204	20,576	22,909	20,453	89.8	100.6			
Madagascar	1,285	1,354	1,374	94.9	93.5	17,086	14,492	17,628	37,908	32,205	39,172	117.9	96.0			
Totals. . .	113,093	112,299	109,209	100.7	103.6	1,671,543	1,723,004	1,602,959	3,714,467	3,828,823	3,562,059	97.0	104.3			

\* Countries not included in the totals. — a) First crop. — b) Second crop. — s) Irrigated rice. — t) Seven inner circles, of which the production represents about three-fifths of the total production of Siam. — (2) Area to be harvested.

*Indo-China* : The rains of September were on the whole very beneficial, despite some destructive flooding, they allowed late transplantings to be carried out in some districts. Additional information indicates an extension of cultivated area in Tonkin ; in Cambodia it does not seem that there has been any considerable reduction in area. The very heavy decrease in Annam and Cochin-China will, however, result in a reduction for Indo-China as a whole of about 1 million acres on that of last year so that the cultivated area has fallen back to the average level of the five years ending 1929-30.

The few partial data available and the general information regarding the crops harvested or the condition of those still standing makes it possible to say that the 1931-32 crop will be little below that of the previous season, despite the decrease in area ; owing to the unfavourable conditions in Annam and despite the satisfactory results obtained in Tonkin, the unit-yield for Indo-China as a whole seems to be a little below the average but above that of last season and at least equal to that of 1929-30.

The few data available concerning stocks indicate that they are exceptionally high ; according to official information there remained in Cochin-China on 15 September 1931 that is, six months after the harvest, though the commercial year is generally at an end for that Colony, about 440 million pounds of rough rice available for export, of which almost all must be spread over the 1932-33 season. In Tonkin and in Annam movement of the crop is difficult owing to the very strict limitation of exports and stocks are equally abundant and maintain the price at a level insufficient to cover cost of production.

*Siam* (Telegram of 11 February) : The carryover of rough rice from 1930-31 is estimated at 6,720,000 centals (14,933,000 bushels) against 4,450,000 (9,956,000) from 1929-30. The amount of new season's rough rice available for export is estimated at 22,720,000 centals (50,489,000 bushels) against 21,120,000 (46,933,000) estimated in January 1932 and 39,200,000 (87,111,000) in February 1931 after the second estimate for the 1930-31 season.

*French West Africa* : Owing to the inadequacy of winter rains in Senegal and Guinea the crop has been deficient ; in Dahomey, the principal rice producing centre, in the Upper Volta and the Ivory Coast, it was good. Crickets have caused only small damage this year in these colonies.

## POTATOES

The area devoted to potatoes in 1931 in the world as a whole has only slightly increased with respect to 1930 and to the average of the five years ending 1929 (about + 2.7 %) and this increase is to be attributed principally to North America and particularly to the United States, where it has been respectively 11.3 % and 2.6 %.

Weather conditions this season have varied greatly with region ; while in northwestern Europe excessive rains in July and August and lack of warmth favoured mildew and rot, while in Spain, Italy and especially in Algeria drought reduced yields.

Potatoes are grown especially in Europe which accounts for about 70 % of world production. In four countries, Germany Poland, France and Czechoslovakia, responsible for about three-fourths of European production 1931 has given very good results. In France also the crop has been very good, exceeding not only the very poor crop of 1930 by 15.8 % but the quinquennial average by 13 % and approximating closely to the excellent crop of 1929. If 1931 has given good results quantitatively, quality leaves much to be desired and it is feared that the excessive rains have prejudiced storing quality.

In the European countries of minor importance output has been excellent in Belgium, Rumania and Switzerland and on the other hand deficient in Great Britain and Northern Ireland, the Netherlands, which are the chief exporting country, Hungary, which normally exports very considerable quantities, and particularly in Italy. Coun-

tries cultivating particularly early varieties, like Spain, Italy and Algeria, have obtained only poor crops, especially in the last, where production in 1931 has been 30 % below that of last year and the quinquennial mean.

*Potatoes.*

COUNTRIES	AREA					PRODUCTION						
	1931	1930	Aver. 1925 to 1929	% 1931	1931	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931
	—	—	—	—	1931/32	—	—	—	—	—	—	1931/32
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931	Aver. 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931
	1,000 acres					1,000 centals			1,000 bush. of 60 lbs.			
Germany. . .	6,979	6,980	6,945	100.7	100.5	967,001	1,038,372	840,606	1,611,787	1,730,585	1,400,982	93.1
Austria (s) . .	61	59	46	103.0	131.3	4,442	4,849	3,879	7,404	8,081	6,405	91.6
Belgium (s) . .	418	407	406	102.6	102.7	47,677	53,642	40,051	79,461	89,401	76,751	88.9
Bulgaria . . .	425	402	408	105.8	101.2	78,857	65,310	74,752	131,425	108,847	124,584	120.7
Denmark. . .	32	35	26	92.9	122.3	1,720	1,852	822	2,866	3,086	1,381	92.9
Spain . . .	150	167	173	93.7	90.3	10,842	21,703	21,746	33,069	36,172	36,242	91.4
Estonia . . .	915 (x)	812	...	...	...	74,499	92,664	(x) 83,804	124,162	154,437 (x)	130,670	80.4
*Irish Fr. St. .	168	168	166	90.7	100.9	18,889	19,028	15,748	31,398	31,713	26,246	99.0
Finland . . .	348	346	389	100.4	94.3	52,359	52,714	52,359	87,265	87,854	...	...
France. . .	174	175	171	99.3	101.6	15,997	17,314	16,513	26,661	28,856	27,521	92.4
Gr. Britain. . .	3,532	3,532	3,606	99.6	97.5	355,321	306,949	314,368	592,190	511,572	523,036	125.8
Hungary . . .	709	684	809	103.6	88.6	85,209	99,892	119,096	142,015	106,486	198,489	85.3
Italy . . .	710	673	652	105.6	108.9	32,445	40,597	43,333	54,074	67,660	72,221	79.9
Latvia . . .	874	864	868	101.3	100.7	33,136	43,077	43,839	55,226	71,794	73,064	76.9
Lithuania . .	247	231	201	108.8	122.7	25,729	24,841	17,038	42,880	40,568	28,476	105.7
Luxemburg. .	409	403	347	101.4	117.9	43,254	41,643	32,287	72,089	69,404	53,810	108.9
Malta . . .	41	40	40	105.2	105.4	4,700	3,525	3,818	7,832	5,376	6,363	133.3
Norway . . .	7	7	7	90.2	97.0	670	644	599	1,117	1,074	999	104.0
Netherlands .	116	117	120	99.8	97.3	17,071	16,886	18,913	28,451	28,143	31,521	101.1
Poland . . .	401	397	432	100.9	92.7	56,699	67,016	73,267	94,496	111,691	122,109	84.6
Portugal. . .	6,716	6,602	6,125	101.7	109.6	683,179	681,282	583,299	1,138,609	1,135,448	972,146	100.3
Rumania (2) .	62	66	54	94.0	113.4	6,614	12,454	6,680	11,023	20,756	11,147	53.1
Sweden . . .	474	468	482	101.2	98.2	52,382	39,908	42,587	87,302	66,654	70,976	181.0
Switzerland .	327	336	366	97.5	89.4	33,020	30,668	38,039	55,033	66,112	63,397	83.2
Czechoslov. .	113	120	117	94.2	96.7	16,447	13,007	15,633	27,410	21,678	26,054	126.4
1931/32	1,775	1,639	1,793	108.3	99.0	214,420	197,324	191,719	357,375	328,867	319,525	108.7
<b>Total Eur.</b>	<b>\$ 25,825</b>	<b>25,437</b>	<b>25,163</b>	<b>101.5</b>	<b>102.7</b>	<b>2,889,269</b>	<b>2,943,032</b>	<b>2,648,506</b>	<b>4,815,355</b>	<b>4,904,961</b>	<b>4,411,075</b>	<b>98.2</b>
<b>*U. S. S. R.</b>	<b>15,083</b>	<b>14,378</b>	<b>13,477</b>	<b>104.9</b>	<b>111.9</b>	<b>...</b>	<b>...</b>	<b>962,453</b>	<b>...</b>	<b>...</b>	<b>1,604,057</b>	<b>...</b>
Canada . . .	584	571	552	102.2	105.8	52,305	48,241	44,747	87,175	80,402	74,577	108.4
Unit. States .	3,382	3,038	3,297	111.3	102.6	225,749	199,926	224,716	376,248	333,210	374,520	112.9
<b>Total Amer.</b>	<b>3,966</b>	<b>3,609</b>	<b>3,849</b>	<b>109.9</b>	<b>103.1</b>	<b>278,054</b>	<b>248,167</b>	<b>269,463</b>	<b>463,423</b>	<b>413,612</b>	<b>449,097</b>	<b>112.9</b>
Syria & Leb. .	20	18	14	113.8	144.1	946	1,085	1,027	1,578	1,808	1,711	87.2
Algeria (s) . .	27	26	25	104.6	108.3	723	917	924	1,205	1,528	1,540	78.9
*Chile . . .	101	111	93	91.7	108.8	...	9,861	8,134	...	16,435	13,556	...
Madagascar .	45	50	66	90.2	69.3	1,411	1,323	1,895	2,352	2,205	3,159	106.7
*New Zeal. . .	22	24	23	93.8	98.4	...	2,990	2,848	...	4,984	4,746	...
<b>Grand Totals</b>	<b>\$ 29,883</b>	<b>29,140</b>	<b>29,117</b>	<b>102.6</b>	<b>102.6</b>	<b>3,170,403</b>	<b>3,194,524</b>	<b>2,921,869</b>	<b>5,283,911</b>	<b>5,324,113</b>	<b>4,869,582</b>	<b>99.2</b>

\* Countries not included in the totals. — s) Early crop. — l) Late crop. — § For the few countries for which figures are still lacking the data of area in 1930 have been utilised. — (x) Average 1926 to 1929. — (2) Unmixed crop

Canada and the United States, which play no wever, only a relatively small part in world production (about 8 %) have also had good crops. The following are the unit yields in the principal producing countries in 1931 compared with those of last season and the quinquennial mean.

*Yield in centals per acre.*

COUNTRIES	1931	1930	Average 1925-29	COUNTRIES	1931	1930	Average 1925-29
Germany . . . . .	138.6	149.8	121.1	Netherland . . . . .	141.7	168.4	169.4
Poland . . . . .	101.7	103.2	95.2	Belgium . . . . .	105.7	162.6	183.3
France . . . . .	101.1	86.9	87.2	Canada . . . . .	89.7	84.4	81.2
Czechoslovakia . . . . .	120.5	120.4	107.0	Austria . . . . .	114.2	131.6	113.6
U. S. A. . . . .	66.7	65.0	68.2	Italy . . . . .	37.9	49.7	50.6
Gr. Brit. and North. Irel.	120.2	146.0	148.7	Rumania . . . . .	110.4	131.6	88.4

*Yield in bushels of 60 lbs per acre.*

Germany . . . . .	230.9	249.7	201.8	Netherland . . . . .	236.1	280.7	282.4
Poland . . . . .	179.9	172.0	158.7	Belgium . . . . .	324.2	270.9	305.6
France . . . . .	168.5	144.8	145.3	Canada . . . . .	149.4	140.7	135.3
Czechoslovakia . . . . .	200.9	200.7	178.3	Austria . . . . .	190.3	219.3	189.3
U. S. A. . . . .	111.2	108.4	113.6	Italy . . . . .	63.2	82.8	84.3
Gr. Brit. and North. Irel.	200.3	243.3	247.0	Rumania . . . . .	183.0	219.3	147.4

Summing up, it may be said that 1931 has given a plentiful world production, which nearly attains the level of the bumper crop of 1930 and exceeds the quinquennial mean by 8.5 %.

V. B.

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*Great Britain and Northern Ireland* : In Northern Ireland, with the exception of a few isolated instances of rotting in low-lying districts, the crop is keeping very well. The average yield per acre is estimated at 5.2 tons, just over one ton less than in 1930 and almost 1 ½ tons less than the ten-year average.

*Italy* : Planting of early varieties was continued in January.

*U. S. S. R.* : According to the programme arranged by the Government, the area to be planted to potatoes next spring should be about 17 million acres compared with just over 15 million in 1931.

*Palestine* : Sowing of potatoes is concluded. Early sown crops suffered severely from frost in December. The area under this crop has greatly increased.

*Algeria* : Owing to damage caused by frost, hail and especially by the excessive rain in December, yields of the first early potatoes harvested are only average; the plantings made at the end of November have, on the other hand, sprouted very vigorously and have a very satisfactory appearance. The area prepared for spring sowings makes an increase of this crop probable.

## SUGAR

Since the publication of the January "Crop Report" the data of Belgium, Finland, Great Britain, Hungary and Rumania for beet-sugar and those of Argentina, Jamaica, Mexico, Porto Rico, British India and the Union of South Africa for cane-sugar have undergone modification, while new data are available from Mozambique.

On the whole these modifications have brought a slight decrease in production of beet-sugar and an increase in that of cane-sugar with respect to the estimates of the previous month. The increase in the estimate for British India is particularly notable;

*Production of Cane Sugar.*

COUNTRIES	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	Percentages for 1931-32	
							1930-31 = 100	Average = 100
							%	
Thousand centals			Short tons					
AMERICA.								
Argentina . . . . .	7,622	8,412	8,811	381,124	420,595	440,511	91	86
Brazil . . . . .	21,164	20,159	19,385	1,060,000	1,007,900	969,247	105	109
Cuba . . . . .	69,934	69,933	104,428	3,200,000	3,496,000	5,221,343	91	61
Ecuador . . . . .	423	425	432	21,100	21,800	21,577	99	98
United States . . . . .	3,120	3,674	1,911	150,000	183,693	95,575	85	103
Guadeloupe . . . . .	816	375	542	41,000	19,000	27,100	218	150
Jamaica . . . . .	1,323	1,279	1,329	66,000	64,000	66,438	103	99
Mexico . . . . .	5,290	5,247	4,242	265,000	262,000	212,100	101	125
Peru . . . . .	10,196	9,480	8,009	509,800	470,000	400,458	108	127
Porto Rico . . . . .	18,977	15,673	13,716	948,900	783,664	685,800	121	138
Dominican Republic . . . . .	8,407	8,125	7,707	424,850	406,237	385,330	105	110
Salvador . . . . .	666	1,024	507	33,289	51,210	25,353	65	131
Total, America . . .	142,028	143,806	171,019	7,107,000	7,186,700	8,550,889	99	83
ASIA.								
Formosa . . . . .	20,279	17,577	13,620	1,013,952	878,841	681,427	115	149
India . . . . .	86,912	72,083	66,618	4,346,000	3,804,000	3,330,880	121	130
Japan . . . . .	1,951	1,703	1,857	97,525	88,153	92,859	111	105
Java . . . . .	54,013	62,663	57,172	2,700,000	3,133,116	2,858,554	86	94
Philippine Is. . . . .	18,960	18,706	16,404	950,000	939,771	820,180	101	116
Total, Asia . . .	182,115	172,832	155,680	9,107,000	8,643,881	7,783,900	105	117
AFRICA.								
Egypt . . . . .	2,646	2,685	2,094	130,000	134,300	104,691	99	126
Mauritius . . . . .	3,858	4,871	5,011	193,000	243,500	252,045	79	77
Mozambique . . . . .	3,417	1,907	1,622	171,000	95,300	81,076	179	211
Reunion . . . . .	661	1,102	1,116	30,000	55,000	55,775	60	59
Union of S. Africa . . . . .	6,588	7,860	5,207	329,400	393,000	264,871	84	121
Total, Africa . . .	17,170	18,425	15,170	853,000	921,100	758,458	93	113
OCEANIA.								
Australia . . . . .	11,900	11,927	11,283	594,000	596,374	564,162	100	105
Hawaii . . . . .	19,120	19,160	17,340	956,000	958,000	867,007	100	110
Fiji Is. . . . .	1,819	2,019	2,002	90,900	101,000	100,083	90	91
Total, Oceania . . .	32,839	33,106	30,625	1,641,000	1,655,374	1,531,252	99	107
General Totals . . .	374,152	368,219	372,494	18,708,000	18,407,115	18,624,499	102	100

(x) Approximate data.

according to the first estimations production was 75,000,000 centals (3,750,000 short tons) but a telegram now received by the Institute from the Government of India gives a production in 1931-32 of 86,900,000 centals (4,350,000 short tons). This modification is due in part to the increase in area under cane but to a much greater extent to the unit yield, which has this year been particularly high, reaching the maximum recorded in British India in recent years. With these modifications the production of cane-sugar forecast for 1931-32 for countries accounting for 95 % of world-production of cane-sugar should be 2 % greater than that of 1930-31 and almost equal to the average of the five years ending 1929-30.

Adding the figures for beet-sugar production and those for cane-sugar production and allowing for the 5 % produced in countries not appearing in the table, the world total is about 578,000,000 centals (28,900,000 short tons) of sugar, that is, 90 % of the 1930-31 figure and 99 % of the five-year average. In this connection it must, however, be noted that the estimates made at this period of the year should always be considered as very approximate and are this year all the more uncertain in that no precise information is yet available concerning the two most important producers, Cuba and Java.

## Production of Beet Sugar (raw).

COUNTRIES	Production 1 September-31 January				Total production during the season						% 1931-32	
	1931-32	1930-31	1931-32	1930-31	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1930-31 = 100	Average = 100
	thousand centals		short tons		thousand centals			short tons				
Germany . . . . .	34,412	54,997	1,720,620	2,740,792	34,684	56,162	38,741	1,734,200	2,808,077	1,937,038	62	89
Austria . . . . .	3,570	3,295	178,473	164,761	3,641	3,313	2,185	182,000	165,620	109,280	110	167
Belgium . . . . .	(2) 4,415	(2) 6,076	(2) 220,725	(2) 303,801	4,510	6,138	5,049	225,971	308,394	297,449	74	76
Bulgaria . . . . .	531	1,084	26,532	54,196	568	1,204	902	28,397	60,205	30,060	47	94
Denmark . . . . .	---	---	---	---	2,755	3,690	3,303	138,000	185,000	165,147	75	88
Spain (4) . . . . .	(2) 4,373	(2) 3,801	(2) 218,434	(2) 193,054	6,393	6,369	4,813	320,000	318,440	240,638	100	135
Irish Free State . . . . .	---	---	---	---	125	468	430	6,257	23,390	21,794	27	29
Finland . . . . .	---	---	---	---	83	82	69	1,173	4,079	3,441	102	121
France . . . . .	(3) 18,033	(3) 23,503	(3) 931,617	(3) 1,175,146	18,864	26,031	18,258	943,200	1,301,712	912,883	72	103
Great Britain . . . . .	6,020	10,127	300,393	506,363	6,020	10,127	4,032	300,933	506,363	201,611	50	149
Hungary . . . . .	(-) 2,761	(2) 5,154	(2) 138,036	(2) 257,706	2,761	5,154	4,386	138,036	257,712	219,317	54	63
Italy . . . . .	8,270	9,498	413,476	474,903	8,270	9,498	7,039	413,476	474,903	351,957	87	117
Latvia . . . . .	---	---	---	---	287	152	(5) 204	14,300	6,625	(5) 10,185	216	141
Netherlands . . . . .	(-) 3,677	(2) 6,310	(2) 188,828	(2) 315,481	3,858	6,350	6,212	193,000	317,958	310,575	61	62
Poland . . . . .	(2) 10,809	(2) 16,581	(2) 540,428	(2) 829,015	10,849	17,119	15,045	542,450	855,949	752,221	63	72
Rumania . . . . .	---	---	---	---	907	3,620	2,745	49,857	181,010	137,283	27	36
Sweden . . . . .	---	---	---	---	3,153	4,112	2,881	158,000	205,618	144,032	77	106
Switzerland . . . . .	---	---	---	---	132	120	152	7,000	6,800	7,600	105	87
Czechoslovakia . . . . .	(2) 17,722	(2) 24,080	(2) 886,080	(2) 1,233,087	17,722	25,173	26,016	886,089	1,258,614	1,800,763	70	68
Turkey . . . . .	---	---	---	---	853	214	101	18,000	10,700	5,028	165	351
Yugoslavia . . . . .	---	---	---	---	1,955	2,320	2,082	97,752	116,316	104,109	84	94
<i>Total, Europe . . a)</i>	---	---	---	---	127,390	187,129	145,251	6,401,160	9,371,494	7,282,406	68	88
U. S. S. R. . . . .	---	---	---	---	33,069	30,266	24,066	1,050,000	1,003,284	1,209,288	84	137
<i>Total, Europe . . b)</i>	---	---	---	---	161,059	226,695	169,317	8,051,160	11,374,778	8,465,694	71	95
Canada . . . . .	---	---	---	---	1,058	1,075	769	53,000	58,763	38,435	98	133
United States . . . . .	---	---	---	---	24,022	25,970	21,428	1,201,000	1,299,000	1,071,390	92	112
<i>Totals, North America</i>	---	---	---	---	25,080	27,054	22,197	1,254,000	1,357,763	1,109,825	93	113
Korea . . . . .	---	---	---	---	37	22	13	1,837	1,100	635	166	239
Japan . . . . .	---	---	---	---	601	532	545	30,030	26,583	27,231	113	110
<i>Total, Asia . . . .</i>	---	---	---	---	638	554	558	31,867	27,683	27,866	116	115
Australia . . . . .	---	---	---	---	114	75	48	5,700	3,752	2,416	152	239
<i>General total . . (a)</i>	---	---	---	---	153,822	215,112	168,054	7,692,733	10,755,701	8,402,513	72	92
<i>General total . . (b)</i>	---	---	---	---	186,591	254,378	192,120	9,342,733	12,718,985	9,605,501	73	97

a) Not including the U. S. S. R. — b) Including the U. S. S. R. — (1) Approximate data. — (2) To the end of December. — (3) To January 15th. — (4) The season begins on 1st July. — (5) Average 1928-29 to 1929-30.

Both Cuba and Java, though adhering to the international agreement, have until now in neither case taken any decision as to the production of the current campaign. In a general way it is known that production must be reduced, that general conditions on the world market, the accumulation of stocks, the decrease in consumption and the continual fall in prices permit of no other solution. In the case of Java there are also peculiar difficulties in its own markets, particularly in British India, which shows an even more accentuated desire to make itself independent of sugar imports. But both countries, for internal reasons as well as by reason of the difficulties involved in a drastic restriction of cane cutting and reduction in sugar production in the case of a perennial crop in regard to which so many interests interplay, can only with great difficulty decide on a restriction of the severity demanded by the market situation. The Cuban colonos are directly opposed to a fresh restriction while in Java there is a desire to commence restriction on a large scale only from 1933 onward and to produce this year at least 54,000,000 centals (2,700,000 short tons), an amount that seems too high

to the Cubans. Thus, until some solution of the problem is reached in these two countries, the above estimates are of highly provisional nature.

If, however, total production of beet and cane-sugar reaches the figure above indicated of 578,000,000 centals (28,900,000 short tons) it may be assumed that the situation of the sugar market in the current season will scarcely improve since production in 1931-32 will almost equal the average consumption of recent years. At the end of 1931-32 there should therefore be stocks not very different from those at the end of 1930-31.

R. R.

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*France*: The General Federation of beet growers has advised all its members to reduce their sowings owing to the economic situation. It also demands that contracts with sugar manufacturers shall be made on a basis more favourable to growers and that the modifications made by manufacturers in 1931 shall be renewed. The result of the negotiations in course will certainly have a considerable influence on this year's beet area. Work preparatory to sowing has been effected under excellent conditions. The production of beet for distillation was slightly smaller in 1931 than in the previous year (22,521,000 centals or 1,126,000 short tons against 24,654,000 centals or 1,233,000 short tons; percentage 91.3) despite a considerable increase in the area cultivated (92,200 acres against 80,600 or + 14.3 %). In comparison with the average of 1925-29, on the contrary, there was an increase in production of 35.0 % which is larger than the relative increase in average area of 27.4 %.

### *Sugar-beet.*

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931	1931	1931	1930	Average 1925 to 1929	1931	1930	Aver. 1925 to 1929	% 1931	1931
	—	—	—	—	1931/32	—	—	—	—	—	—	—	1931/32
	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Aver. 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Aver. 1931 = 100
	1,000 acres					1,000 centals			1,000 short tons				
Germany . . . . .	941	1,194	1,068	78.9	88.6	243,370	328,900	237,119	12,168	16,445	11,856	74.0	102.6
Austria . . . . .	106	88	62	121.1	171.4	23,534	21,457	13,724	1,177	1,073	680	109.7	171.5
Belgium . . . . .	128	140	182	91.6	79.1	32,310	41,123	40,706	1,615	2,056	2,035	78.0	79.4
Bulgaria . . . . .	37	49	35	76.0	106.1	5,291	6,899	4,247	265	344	212	76.8	124.6
Denmark . . . . .	76	81	93	92.2	80.2	18,298	23,573	24,153	915	1,179	1,208	77.6	75.8
Spain . . . . .	...	197	181	...	...	66,295	51,197	34,872	3,265	2,560	1,744	127.5	187.2
Finland . . . . .	5	3	5	161.6	96.3	794	683	773	40	34	39	116.1	102.7
France . . . . .	599	679	601	88.2	96.8	134,251	194,329	127,346	6,712	9,716	6,307	69.1	105.4
England and Wales . . . . .	233	347	162	67.1	144.0	44,800	68,180	28,306	2,240	3,407	1,415	65.8	158.3
Scotland . . . . .	1	2	4	57.4	26.1	114	269	442	6	13	22	42.5	25.9
Hungary . . . . .	142	183	168	77.3	84.5	22,743	32,210	32,947	1,137	1,610	1,647	70.6	69.0
Italy . . . . .	270	277	226	97.7	119.8	52,263	67,219	51,465	2,613	3,361	2,573	77.8	101.6
Netherlands . . . . .	91	142	157	64.2	53.1	22,346	47,127	46,341	1,117	2,356	2,317	47.4	48.2
*Poland . . . . .	380	457	510	83.1	74.4	...	103,003	92,177	...	5,200	4,600	...	...
*Rumania . . . . .	50	113	167	43.9	29.7	...	18,708	24,143	...	935	1,207	...	...
Sweden . . . . .	87	91	78	95.6	111.8	19,317	26,737	19,233	966	1,339	962	73.1	100.4
Czechoslovakia . . . . .	458	553	671	82.9	68.3	115,541	141,567	157,619	5,777	7,078	7,881	81.6	73.3
Total Europe . . . . .	(§) 3,370	4,026	3,668	83.6	91.8	300,267	1,051,460	819,292	40,013	52,571	40,964	76.1	97.7
U. S. S. R. . . . .	3,332	2,533	1,626	131.6	204.9	308,648	334,434	186,268	15,432	16,721	9,313	92.3	165.7
Canada . . . . .	51	52	46	97.1	111.2	9,180	9,420	8,685	459	471	434	97.5	105.7
United States . . . . .	720	775	675	92.9	106.6	158,660	183,980	147,093	7,933	9,190	7,355	86.2	107.9
Australia . . . . .	4	3	2	138.0	193.0	858	627	440	43	31	22	136.8	194.9
Totals . . . . .	(§) 7,477	7,389	6,917	101.1	124.3	1,277,613	1,579,921	1,161,778	63,869	78,993	58,068	86.9	110.0

\* Countries not included in the totals. — (§) For the few countries for which figures are still lacking the data of area in 1930 have been utilised.



*U. S. S. R.*: According to the Government's plan a total of 4,127,000 acres should be sown to sugar beet next spring against 3,684,000 in 1931.

*Mexico*: Crop condition of cane in the principal producing areas is satisfactory. In some areas cutting began in December; yields are considered normal.

*India*: The final estimate of the area under sugar cane in 1931-32 is 2,886,000 acres against 2,797,000 in 1930-31 and 2,721,000 on the average for the preceding five seasons; percentages: 103.2 and 106.1.

*Dutch East Indies*: The Java experimental station communicates that although the latter half of January was drier than the first, rainfall during the month was more or less sufficient. Crop condition of the cane is not bad.

*Egypt*: The sugar-cane crop has completed maturity and harvesting is in full swing. The crop is supplied to the sugar factories and native squeezers for the making of molasses as well as for local consumption. In Kom Omfio, Assuan province, the sowing of certain areas of the new crop is proceeding.

The crop condition of sugar cane at the beginning of February was 103 as on 1 January 1932 against 102 on 1 February 1931.

*Madagascar*: The area of plantations in bearing during the 1931-32 season showed a fresh though slight increase on that of the last and preceding years: 54,000 acres against 52,200 in 1930-31 (104 %) and 40,800 on the average of the five years ending 1929-30 (133 %). On the other hand production is slightly lower: 8,800,000 centals (441,000 short tons) against 9,300,000 (463,000), 95 % and 9,535,000 (476,700), 93 %. On 1 January 1932 crop condition was good.

*Réunion*: A destructive cyclone crossed the island on 4 February.

*Union of South Africa*: The campaign was practically completed by the end of December. December crop condition averaged 18 % below normal; rainfall was fairly well distributed over the whole of the sugar belt.

## VINES

*Austria*: On February 1 the crop condition of vines was 2.3 against 2.4 on January 1, 1932 and 2.1 on February 1, 1931.

*France*: January was on the whole a fairly fine month, following a rainy period at the end of December. In the South, however, there were three distinct periods of fairly heavy rain; the last fall, followed immediately by a sharp drop in temperature with night frosts and thawing during the day hindered field work and manure carting, which are somewhat in delay; pruning operations also had to be suspended. The cold checked growth which had started too vigorously. In the Garonne valley and the Southwest, fine, dry weather in January with a cold spell at the beginning and another at the beginning of February, favoured work in the vineyards and growth. In the more northern vineyards, the Loire valley, Burgundy and the Rhône valley, January weather was rather mild and damp with frequent mist, these conditions being not altogether favourable for field work and growth; the accompanying fall in temperature was unfavourable. In the East dry, cold weather was beneficial. On the whole the French vine situation at the middle of February was rather satisfactory. Quite the opposite applies to the commercial situation which remained poor. Taxed consumption is maintained at a high level, producers' deliveries are normal and trade stocks are diminishing but transactions are very restricted. There is great uncertainty on the

## Vines.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	1931		1931	1930	Aver. 1925 to 1929	1931	1930	Aver. 1925 to 1929	% 1931	
				1930	Aver.							1930	Aver.
1,000 acres			= 100	= 100	1,000 Imperial gallons		1,000 American gallons		= 100	= 100			
Germany 1)2)	176	176	189	90.8	97.9	62,473	61,895	35,549	75,025	74,331	42,691	100.9	175.7
Austria (1)	78	77	80	101.0	96.8	29,565	26,450	12,738	35,505	31,704	15,297	111.8	232.1
Bulgaria . .	217	205	189	106.0	114.8	61,799	57,744	33,235	74,179	69,345	39,912	107.0	185.9
Spain 1)2)	3,526	3,495	3,429	100.9	102.8	419,583	400,072	518,520	503,881	481,531	622,006	101.6	80.9
France . . .	3,559	3,465	3,462	102.7	102.8	1,263,938	924,141	1,205,894	1,517,870	1,109,816	1,418,171	136.8	101.8
Greece (2), .	...	304	277	...	...	35,482	48,065	59,958	42,611	58,308	68,401	75.0	62.3
Hungary 2)2)	521	527	521	98.9	100.1	84,377	88,466	53,380	101,329	106,239	64,104	95.4	158.1
Italy . . (s)	1,955	1,948	2,078	100.4	94.1	731,146	799,231	606,147	878,041	959,805	1,088,201	91.5	80.7
Luxemb. 1)2)	3	3	4	88.6	74.0	1,889	844	1,063	2,258	1,014	1,277	223.7	176.9
Portugal, . .	868	859	856	...	101.4	148,483	129,612	132,445	178,315	155,652	159,051	114.6	112.1
Switzerland	33	33	35	99.3	93.4	15,178	14,078	12,282	18,228	16,907	14,750	107.8	123.6
* Czechoslov.	47	44	42	105.5	111.4	...	10,427	4,864	...	12,521	5,841	...	...
* Syria and Lebanon.	125	126	123	99.2	101.0	—	—	—	—	—	—	—	—
Algeria (1)	771	670	528	115.1	146.1	348,808	298,317	221,277	418,887	358,252	277,743	116.9	150.8
Fr. Morocco	22	22	15	100.0	149.9	5,543	4,176	3,080	6,657	5,015	3,698	132.8	180.0
Tunis . . .	98	87	74	113.1	133.5	15,062	21,998	18,898	18,800	26,417	22,694	71.2	82.9
Totals . .	—	—	—	—	—	3,175,489	2,830,157	3,165,953	3,813,479	3,398,763	3,802,022	113.2	100.3

\* Countries not included in the totals. — s) Unmixed crop. — t) Mixed crop. — (1) Crop in bearing. — (2) Must: these figures have been calculated in terms of wine on the basis of the coefficient 9/10 and included in the total.

market concerning the application of the recent decrees on the compulsory holding of part of stocks and compulsory distillation. Quotations fluctuated between mid-January and the beginning of February; towards the end of the first half of the latter month, the fall was checked and a slight recovery took place.

*Uruguay*: According to information from private sources total supplies on 30 June 1931 at the beginning of the viticultural year 1931-32 amounted, production and stocks included, to 9,613,000 (11,544,000) gallons, though the total on 30 June of the preceding year was 10,405,000 (12,195,000) gallons (92 4 %).

*Algeria*: Fine weather returned in January interrupted by brief rains and permitted the resumption of work in the vineyards which had been discontinued in December. At the end of the month pruning had been completed on the coast and continued actively in the mountains; weather conditions were favourable. Winter treatments have also continued actively. Field work and baring were proceeded with more rapidly as the vines were infested with weeds. Replacements of vines were effected under excellent conditions, as the soil was dry. Some new plantings are reported in nearly all districts. According to information from a private source the area under vines in bearing is not 853,000 but only 771,000 acres. This confirms the reserves we formulated last month in regard to the official figure.

*French Morocco*: Pruning and winter cultivations were facilitated by the continued fine weather. New plantings appear to be large this year.

*Australia*: Thrips invasions were noted in South Australian, New South Wales and Victorian vineyards, but there is no definite evidence that this pest has affected the setting of the grapes as seriously as was at first feared.

In South Australia, which is the most important of the Australian States for wine-production, it is said that, in the vine growing districts frost-bitten in October the loss is not so great as was at first feared, for though the "nipped", vines have, in many instances, made a splendid recovery, so much so that the estimated 30 % loss may be cut down to from 15 to 20 per cent. Therefore, optimism is prevailing and a surplus of grapes is expected for the next vintage.

In New South Wales, the setting was satisfactory at the end of December, despite the great prevalence of thrips among the vines, but, weather conditions generally having been abnormal, with frequent rains and varying temperatures, some days hot and muggy, others quite cold, development of fungus diseases is to be expected; downy mildew has already made its appearance. In Victorian vineyards, abundant November rainfall was welcome as the soil was needing water. There is a very good all round show of fruits on the vines. On the whole, there are fairly good prospects for the Australian vintage, but everything depends on the setting of the blossom and the absence of dropping, and also on the development of thrips and fungus diseases. The wine trade is still depressed and very little wine is being sold by growers to the merchants. The position as regards storage is serious.

## OLIVES

*Palestine*: Pruning of olive trees is in progress; rainfall was below average up to the end of January.

*Syria and Lebanon*: The only complaint reported in Lebanon is the fall of fruit; crop condition at the beginning of January was average. In the government of Latakia (Alawiyya State) condition was normal. The persistent drought of last month prevented fruit reaching its normal size and made pressing difficult.

### Olive and Olive Oil Production.

COUNTRIES	AREA					ENGLISH MEASURES			AMERICAN MEASURES			% 1931/32	
	1931/32	1930/31	Average 1925/26 to 1929/30	% 1931/32		1931/32	1930/31	Average 1925/26 to 1929/30	1931/32	1930/31	Average 1925/26 to 1929/30	1930/ 1931 = 100	Aver. = 100
	Thousand acres			1930/ 1931 = 100	Aver. = 100	Thousand centals			Thous- (s) pounds and (t) American gallons			%	%
Spain (1) . . . .	...	4,651	4,296	...	...	(s) 48,480	18,655	48,446	4,347,964	1,365,498	4,844,563	318.4	89.7
Greece . . . . .	---	---	---	---	---	(t) 8,300	2,534	9,153	109,187	33,298	120,273	327.9	90.8
Italy . . . . . (a)	1,492	1,492	1,425	100.0	104.7	(s) 29,655	17,196	27,658	2,965,472	1,719,587	2,765,771	172.5	107.2
Portugal . . . . . (b)	4,131	4,133	4,201	99.9	98.3	(t) ...	2,714	4,301	...	35,637	56,515	...	...
United States . .	---	---	---	---	---	(s) 320	400	370	82,000	40,000	36,960	80.0	86.6
Syria and Lebanon . . .	188	187	170	100.5	110.9	(s) 1,476	973	1,244	147,022	97,384	124,352	151.7	118.7
Algeria . . . . .	108	109	99	94.3	103.7	(t) 464	411	462	6,108	5,405	6,075	112.9	100.5
Tunis . . . . .	---	---	---	---	---	(t) 1,100	400	880	14,500	5,200	11,800	278.0	125.0

a) Pure crop. — b) Mixed crop. — s) Olives. — t) Oil. — (1) Area bearing.

*Algeria*: Weather in January was very favourable to harvesting, which was completed at the end of the month, but wind and rain in December caused the fall of much fruit, while starlings also caused damage in some districts. The crop is average and yield of oil satisfactory.

*Tunis* : Harvesting is still in progress. The cyclone of December 12 caused extensive dropping of olives which explains the reduction of the estimate of production by 17 % to 220,000 centals (2,900,000 American gallons) of oil. The olive trees remain in good condition.

### COTTON

*United States* : The quantity of cotton, not including linters, ginned from the 1931-32 crop to close of business on 15 January, 1932 amounted to 15,992,000 running bales (counting round bales as half-bales), against 13,594,000 in January 1931, 14,177,000 in 1930, 13,889,000 in 1929, 12,501,000 in 1928. The preceding figure, to close of business on 12 December, was 15,358,000, against 13,259,000 in 1930, 13,457,000 in 1929, 13,144,000 in 1928 and 12,073,000 in 1927.

*Mexico* : During December sowings continued under good conditions. Area this year is less than last.

*New Hebrides* : Extremely low sale prices not covering the relatively high cost of production and persistent endemic disease since 1926 have led to the abandonment of

#### Cotton.

COUNTRIES	AREA					PRODUCTION									
	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32		1931/32	1930/31	Aver. 1925/26 to 1929/30	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32			
				1930/ 1931	Aver. 1931 = 100							1930/ 1931	Aver. 1931 = 100		
1,000 acres					1,000 centals			1,000 bales of 478 lbs.							
Bulgaria . . . .	13	13	11	97.0	120.4	23	18	15	5	4	8	130.8	161.1		
Italy . . . . .	2	9	9	26.8	26.9	4	21	16	1	4	3	17.7	23.8		
*U. S. S. R. . .	5,281	3,870	1,074	130.4	207.5	...	7,403	5,030	...	1,549	1,052	...	...		
United States .	40,495	45,091	44,832	89.8	90.2	80,868	66,505	72,983	16,918	13,932	15,268	121.4	110.8		
Mexico . . . . .	319	300	472	81.8	67.7	989	848	1,205	207	178	253	116.6	81.9		
Total North Am.	40,814	45,481	45,354	89.7	90.0	81,857	67,443	74,191	17,125	14,110	15,521	121.4	110.3		
China . . . . .	5,238	5,693	4,474	92.0	117.1	8,839	11,742	9,100	1,849	2,456	1,904	75.3	97.1		
*Korea . . . . .	461	463	495	99.6	93.0	...	726	658	...	152	138	...	...		
India . . . . .	23,511	23,500	25,702	100.0	91.5	16,008	20,440	21,980	3,340	4,276	4,598	78.3	72.8		
Syria & Lebanon	76	60	58	126.3	130.9	81	59	47	17	12	10	137.3	171.6		
Total Asia . .	28,825	29,253	30,234	98.5	95.3	24,928	32,241	31,127	5,215	6,744	6,512	77.3	80.1		
Algeria . . . . .	3	10	15	31.4	21.2	4	25	28	1	5	6	17.0	15.0		
Egypt . . . . .	1,747	2,162	1,828	80.8	95.6	6,140	8,005	7,588	1,286	1,675	1,587	76.8	81.0		
Eritrea . . . . .	7	7	7	107.1	111.1	6	8	8	1	2	2	70.4	70.2		
Uganda . . . . .	876	739	615	118.6	142.4	300	744	620	170	156	130	106.8	128.0		
It. Somaliland .	15	19	16	78.6	91.8	26	17	20	5	3	4	157.1	127.9		
*Ang.-Egyp. Sud.	356	387	274	92.1	130.1	...	509	602	...	106	126	...	...		
*Tanganyika . .	—	—	—	—	—	56	93	98	12	19	21	60.3	56.8		
Total Africa .	2,643	2,937	2,481	90.2	106.8	6,982	8,799	8,264	1,463	1,841	1,729	79.3	84.4		
Grand Totals .	72,302	77,693	78,069	93.1	92.6	113,794	108,522	113,613	23,809	22,703	23,768	104.9	100.2		

\* Countries not included in the totals.

the native crop in most of the islands. On the other hand the Cotton Company of the New Hebrides, created in 1926, is steadily increasing its plantations, which at present cover a total area of about 2,500 acres.

These opposing tendencies resulted in production gradually declining from 1925 to 1928 accompanied by a decrease in exports. Since 1929 the Company's plantations have largely compensated for the restriction of production by farmers and natives from 14,300 centals of raw cotton in 1930 to 22,000-24,300 in 1931.

According to a report presented to the Congress of the French Colonial Cotton Association the total production of the New Hebrides in 1931 is estimated at about 11,000 centals (2,300 bales) of ginned cotton.

*St. Vincent* : At the end of December the cotton crop did not look as promising as it did at the same time the previous year. First pickings have been made. A slight attack of cotton worm (*Alabama argillacea*) was experienced and was easily controlled. Stainers (*Dysdercus*) have made their appearance in one locality.

*India* : The final estimate of the cotton area in the Punjab in 1931-32 is 2,547,000 acres compared with 2,491,000 in 1930-31 and 2,651,000 on the average for the previous five seasons ; percentages 102.2 and 96.1. The figures of production are 2,056,000 centals (430,000 bales) compared with 3,064,000 (641,000) and 2,803,000 (586,000) respectively ; 67.1 % and 73.3 %. Corresponding data for Madras are : area 2,176,000 ; 2,075,000 and 2,133,000 acres ; 104.9 % and 89.4 % ; production : 1,721,000 centals (360,000 bales), 1,670,000 (349,000) and 1,941,000 (406,000) ; percentages : 103.0 and 88.7 respectively.

*French Equatorial Africa* : According to information from private sources the cotton area should be 34,600 acres showing an increase of 4,500 acres on 1930-31.

An increase in production is expected on the basis of the preliminary results of the young plantations as a result of the adoption of modern scientific agricultural methods.

*French West Africa* : The agricultural season has been normal and it is expected that the crop picked from January to April will be as satisfactory in quantity and quality as that of 1931. On the other hand prices remain extremely low and it is feared that the commercial season, which lasts from February to April or May, will show a great decline and that sales will be extremely small.

According to recent information the cotton area in Haute-Volta will be extended in 1930-31 to 137,000 acres. Movement of this crop has been unsatisfactory as out of a production of 70,800 centals of raw cotton only 40,300 have been sold on local markets and only 36,300 were expected to have been sold in 1931. This abnormal difference between the amount produced and that sold makes the estimation of the former difficult ; the apparent deficit in the 1930-31 crop, which would in consequence be underestimated, is attributed to this factor. This correction applies to all the colonies.

The 1931-32 crop has been affected in Senegal by unfavourable meteorological conditions, especially by the insufficiency of the winter rains and by the drought in August. On the Ivory Coast the crop is reported to be good. In Dahomey the area has been maintained in the neighbourhood of last year's thanks only to the efforts of the administration.

*Egypt* : Ploughing of fallow areas and ploughing in of Bersim has started. In Upper Egypt and the southern part of the Delta, preparation of certain areas belonging to large farms has terminated. Sowings are regulated by the decrees of September 27, 1931 (see *Bulletin* of last October).

Cotton ginned from 1 September to end of January, in centals and in bales of 478 lbs. net weight was as follows :

	1931-32	1930-31	1929-30	1928-29
Sakellaridis . . .	(centals) 916,610	1,292,200	1,793,900	1,972,550
	(bales) 191,760	270,330	375,290	412,670
Other varieties . .	(centals) 3,875,870	3,996,890	4,160,640	4,378,670
	(bales) 810,850	836,170	870,430	916,040
Total lint . .	(centals) 4,792,480	5,289,090	5,954,540	6,351,220
	(bales) 1,002,610	1,106,500	1,245,720	1,328,710
Scarto (linters) . .	(centals) 125,320	126,970	137,420	177,810
	(bales) 26,220	26,560	28,750	37,200

The corresponding figures as at the end of December 1931 were respectively as follows: 815,950 centals (170,700 bales); 3,439,670 (719,600); 4,255,620 (890,300); 110,780 (23,170).

*Eritrea*: The crop has been severely damaged by locusts and by *Heliotreps indicus*.

*Uganda*: In general the advent of drier conditions in the latter half of December has led to a slight improvement in the condition of the crop, especially in the Eastern Province. Conditions were not so good in the Buganda Province. In the Northern Province, prospects were generally unsatisfactory. Large quantities have been picked in many areas of the Protectorate. Some damage by stainers is reported.

*Anglo-Egyptian Sudan*: The quantity of cotton harvested up to the end of December 1931 expressed in terms of ginned cotton amounted to 49,200 centals (10,300 bales) compared with 65,200 (13,600) in 1930; 56,800 (11,900) in 1929; 55,600 (11,700) in 1928 and 32,300 (6,800) in 1927.

## FLAX

There is now known the figure of production in Uruguay which ranks third among the linseed exporting countries. The crop is the largest on record but is not so heavy as the forecasts gave reason to expect owing to the losses caused by bad weather in the spring and cryptogamic disease. The yield, however, which is not in proportion to the increased area compared with last year, is normal in relation to the average of the pre-

### Linseed.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	Aver.
	1,000 acres					1,000 centals			1,000 bush. of 56 pounds				
*Germany. . .	16	27	49	59.8	88.4	(x) 73	—	—	(x) 130	—	—	—	—
Austria. . .	5	5	8	90.9	59.8	18	19	27	32	34	49	94.1	65.8
Belgium. . .	36	56	59	64.0	61.0	182	233	287	326	417	512	78.1	63.6
Bulgaria. . .	2	1	1	238.9	299.2	11	3	2	19	5	3	408.4	594.7
Estonia. . .	45	80	89	56.3	50.8	141	279	222	253	499	396	50.6	63.7
Italy. . .	21	24	44	88.5	48.0	113	125	206	202	224	368	90.4	54.9
Latvia (2). .	104	123	163	81.1	63.7	279	410	452	499	733	808	68.1	61.7
Lithuania (2).	139	204	211	67.8	65.6	562	858	824	1,003	1,532	1,471	65.5	63.2
Poland. . .	252	285	280	88.4	90.2	1,087	1,308	1,467	1,941	2,335	2,620	83.1	74.1
Czechoslov. .	22	31	51	71.2	43.1	53	94	202	100	169	361	59.4	27.7
<i>Total Europe</i>	<i>626</i>	<i>814</i>	<i>906</i>	<i>70.5</i>	<i>69.4</i>	<i>2,449</i>	<i>3,329</i>	<i>3,689</i>	<i>4,375</i>	<i>5,948</i>	<i>6,588</i>	<i>73.5</i>	<i>66.4</i>
*U.S.S.R. . .	7,574	5,553	4,267	136.4	177.5	...	...	13,255	...	...	23,670	...	...
Canada. . .	627	582	563	107.8	111.3	1,436	2,839	2,553	2,565	5,069	4,558	50.6	56.3
United States	2,313	3,732	2,909	62.0	79.5	6,170	11,894	11,586	11,018	21,240	20,689	51.9	53.3
India. . .	3,020	2,802	3,392	107.8	89.0	8,467	8,512	8,848	15,120	15,200	15,800	99.5	95.7
*Eritrea. . .	2	—	10	—	31.2	9	—	38	16	—	68	—	23.1
French Maroc	67	58	48	116.1	140.3	411	251	229	734	443	408	164.0	179.9
Argentina. . .	(3) 8,640	(3) 7,511	(3) 6,916	115.0	124.9	46,297	39,348	41,099	82,674	70,265	73,391	117.7	112.6
Uruguay. . .	520	402	204	129.3	255.1	3,205	2,831	1,254	5,723	5,056	2,240	113.2	225.5
<i>Grand Total</i>	<i>15,813</i>	<i>15,901</i>	<i>14,938</i>	<i>99.4</i>	<i>105.9</i>	<i>68,435</i>	<i>69,004</i>	<i>69,258</i>	<i>122,209</i>	<i>123,226</i>	<i>123,674</i>	<i>99.2</i>	<i>98.8</i>

\* Countries not included in the total. — (x) Private estimate. — (2) Flax and hemp. — (3) Area sown.

ceding five years. In fact, whereas the percentage comparisons for area in the season 1931-32 in relation to the previous season and to the average were 129.3 % and 255.1 %, those for production were respectively 113.2 % and 255.5 %.

In Argentina also the weather has not been very favourable to the crops during harvest and yields are generally considered to be not altogether satisfactory and in any case below the forecasts. The quantities available in this country, therefore, to contribute to world supply, estimated at about 42 million centals (75 million bushels) may be reduced as a result of damage during harvest. It is to be noted, however, that some trade authorities affirm that the first estimate of Argentine production of linseed was under-estimated by nearly 1-2 million centals (3.3-5.9 million bushels). On examination of the figures of the first and final estimates in the period 1922-23 to 1930-31, it may be observed that only for the two agricultural seasons 1926-27 to 1927-28 were the final estimates above the forecasts whereas for all the other seasons the final results were smaller; the difference was very large in the years 1923-24, 1926-27 and 1930-31 reaching 10,066,000 centals (17,976,000 bushels), 5,115,000 (9,133,000) and 7,919,000 (14,141,000) respectively demonstrating that the coefficient adopted for weather damage in Argentina is generally too low in relation to crop losses actually incurred. By a recent decree the Banco de la Nación has granted special credits to farmers of 4.50 paper pesos per quintal at an annual rate of interest of 6.50 % and a term of 150 days on the security of the crop.

*Linseed Exports (January 1-December 31).*

EXPORTING COUNTRIES	1928		1929		1930		1931	
	Exports	%	Exports	%	Exports	%	Exports	%
(Centals).								
World exports . . . . .	50,926,953		45,042,796		35,681,937		(1) 48,501,860	
Argentina . . . . .	42,866,870	84.2	35,659,004	79.2	25,786,697	72.3	41,345,763	85.2
India . . . . .	8,827,612	7.5	5,808,043	12.4	5,854,909	16.4	2,515,933	5.2
Uruguay . . . . .	1,332,198	2.6	1,219,608	2.7	1,744,936	4.9	(2) 2,866,019	5.9
Canada . . . . .	1,651,978	3.2	476,262	1.1	782,216	2.2	584,987	1.2
Other countries . . . . .	1,248,295	2.5	2,084,279	4.6	1,513,170	4.2	1,189,158	2.5

(Bushels of 56 lb.).

World exports . . . . .	90,941,235		80,433,732		63,717,917		(1) 86,610,699	
Argentina . . . . .	76,548,190	84.2	63,678,037	79.2	46,047,799	72.3	73,831,921	85.2
India . . . . .	6,835,041	7.5	10,005,461	12.4	10,455,222	16.4	4,492,749	5.2
Uruguay . . . . .	2,378,932	2.6	2,177,877	2.7	3,115,966	4.9	(2) 5,117,905	5.9
Canada . . . . .	2,949,968	3.2	850,470	1.1	1,396,818	2.2	1,044,623	1.2
Other countries . . . . .	2,229,104	2.5	3,721,937	4.6	2,702,112	4.2	2,123,501	2.5

(2) Figure partly estimated.

As regards India, the movement of exports during 1931 was weak as producers preferred to hold their product in view of the low prices prevailing on the world market.

In Argentina and Uruguay, on the contrary, the 1931 trade season was very active; marketing of the crop was normal and stocks were completely disposed of.

*Linseed Imports (January 1-December 31).*

IMPORTING COUNTRIES	1928		1929		1930		1931	
	Imports	%	Imports	%	Imports	%	Imports	%
(Centals).								
<i>World imports</i> . . . . .	51,048,207		49,762,908		34,493,641		(1) 48,501,860	
United States . . . . .	9,843,953	19.3	13,575,979	27.3	7,090,030	20.6	8,109,163	16.7
Germany . . . . .	9,766,185	19.1	6,965,676	14.0	5,193,458	15.1	7,506,613	15.5
Netherlands . . . . .	9,229,617	18.1	7,949,565	16.0	5,616,559	16.3	9,253,714	19.1
Great Britain . . . . .	7,803,180	15.3	6,370,874	12.8	5,030,229	14.6	7,000,235	15.7
France . . . . .	4,632,113	9.1	4,723,241	9.5	4,288,036	12.4	5,812,692	12.0
Belgium . . . . .	2,804,062	5.5	2,515,730	5.1	1,675,034	4.9	3,702,202	7.6
Italy . . . . .	1,449,297	2.8	1,301,708	2.6	1,174,045	3.4	1,350,922	2.8
Other countries . . . . .	5,519,800	10.8	6,360,135	12.7	4,424,450	12.7	5,166,319	10.6
(Bushels of 56 lb.).								
<i>World imports</i> . . . . .	91,157,762		88,862,379		61,595,956		(1) 86,610,699	
United States . . . . .	17,578,535	19.3	24,242,886	27.3	12,662,410	20.6	14,480,687	16.7
Germany . . . . .	17,439,663	19.1	12,438,741	14.0	9,274,057	15.1	13,404,703	15.5
Netherlands . . . . .	16,481,504	18.1	14,195,691	16.0	10,029,598	16.3	16,524,534	19.1
Great Britain . . . . .	13,934,288	15.3	11,376,591	12.8	8,982,577	14.6	13,571,884	15.7
France . . . . .	8,271,653	9.1	8,434,382	9.5	7,658,835	12.4	10,379,835	12.0
Belgium . . . . .	5,007,268	5.5	4,492,387	5.1	2,991,140	4.9	6,611,093	7.6
Italy . . . . .	2,588,038	2.8	2,324,486	2.6	2,096,514	3.4	2,412,368	2.8
Other countries . . . . .	9,856,813	10.8	11,357,415	12.7	7,900,825	12.7	9,225,595	10.6

(1) Figure partly estimated.

In the importing countries demand, despite the crisis, was very active due principally to the fall in prices, which continued during the current month.

A. D. F.

\* \* \*

*Great Britain and Northern Ireland* : Although a definite figure cannot yet be given regarding this season's yield in Northern Ireland reports to hand indicate that it is slightly below average. Quality is satisfactory.

*U. S. S. R.* : According to the programme arranged by the Government the area to be sown to flax for the production of fibre (Dolgunetz) next spring is 6,326,000 acres against 5,779,000 in 1931.

*Argentina* : During January the weather has not been very favourable to harvesting. By a recent decree, the Banco de la Nación has granted growers special credits of 150 days duration with annual interest of 6.5 %. The Banco will hold a mortgage on the product.

*India* : No rain fell during January in Bihar and Orissa ; at the end of the month standing crops were in good condition. Crops were doing well at the end of January in the United Provinces except in unirrigated areas where some withering was caused by lack of rain. In the Central Provinces the condition of standing crops at the end of the month was satisfactory.

*Palestine* : Sowing of linseed is concluded. Germination was generally good. Largely increased areas have been sown to this crop.



*Flax (Fibre).*

COUNTRIES	AREA				PRODUCTION								
	1931	1930	Average to 1929	% 1931		1931	1930	Average to 1929	1931	1930	Average to 1929	% 1931	
				1930 = 100	Average = 100							1930 = 100	Average = 100
1,000 acres		1,000 centals		1,000 pounds									
*Germany . . .	16	27	49	59.8	33.4	(1) 117	—	—	1)11,684	—	—	—	—
Austria †) . .	8	8	(2) 11	90.3	70.2	109	127	(2) 152	10,985	12,694	(2) 15,225	86.1	71.8
Belgium . . .	36	56	59	64.0	01.0	254	325	580	25,370	32,499	57,950	78.1	43.8
Bulgaria . . .	2	1	1	238.9	290.2	2	2	1	176	239	147	73.6	119.8
Estonia . . .	45	80	89	56.3	50.8	131	237	221	13,056	23,745	22,084	55.0	59.1
*Finland (3) . .	10	14	12	72.7	81.9	...	35	31	...	3,527	3,098	...	...
*Northern Irel.	7	29	33	26.1	22.4	...	120	132	...	12,032	13,761	...	...
*Hungary †) . .	44	36	7	123.0	—	...	369	—	...	36,913	—	...	...
Italy . . .	12	13	18	96.5	69.6	50	56	56	5,000	5,573	5,639	89.7	88.7
Latvia (3) . .	104	128	163	81.1	63.7	287	424	437	28,600	42,395	48,714	67.6	58.8
Lithuania (3) .	139	204	211	67.3	65.6	466	642	802	46,623	64,138	80,199	72.6	58.1
Netherlands . .	16	37	37	43.2	43.2	82	230	253	8,234	22,957	25,346	35.9	32.5
Poland . . .	252	285	280	88.4	90.2	670	973	1,243	67,041	97,300	124,345	68.9	53.9
*Rumania . . .	69	44	50	157.5	135.9	...	59	55	...	5,933	5,511	...	...
Czechoslov. . .	22	31	51	71.2	43.1	75	128	238	7,460	12,816	23,764	58.3	31.4
*U. S. S. R. (4)	5,779	4,278	3,271	135.1	176.7	...	9,449	7,064	...	944,904	706,425	...	...
Total . . . .	636	843	920	74.9	69.3	2,039	3,042	3,911	203,321	304,251	391,233	67.0	52.1

\* Countries not included in the totals. — †) Production expressed in terms of dried flax straw. — (1) Private estimate. — (2) Average 1927 to 1929. — (3) Flax and hemp. — (4) Dolgunetz quality.

**HEMP**

U. S. S. R. : According to the Government's plan the area to be sown to hemp next spring is 2,530,000 acres against 2,282,000 in 1931.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931				
				1930 = 100	Average = 100				1930 = 100	Average = 100			
											1,000 acres		1,000 pounds
Fibre.													
*Germany (1) . . . . .	1	1	4	80.4	19.5	—	—	—	—	—	—	—	
Austria . . . . .	1	1	(2) 1	80.4	80.9	(3) 1,301	(3) 1,789	(3) 1,770	72.7	73.5	75.5	72.7	
Bulgaria . . . . .	9	9	10	102.6	94.8	4,189	3,299	3,028	127.0	133.3	138.3	127.0	
France . . . . .	9	11	12	84.9	73.7	8,203	10,434	10,822	78.6	75.3	75.3	78.6	
Italy . . . . .	160	214	236	74.8	67.9	125,959	201,400	222,033	62.5	56.7	56.7	62.5	
Poland . . . . .	76	79	74	97.1	102.8	31,778	46,103	42,655	68.9	74.5	74.5	68.9	
*Rumania . . . . .	120	83	101	145.3	118.9	...	37,323	36,741	...	...	...	...	
Czechoslovakia . . . .	20	15	26	132.9	80.0	9,180	8,959	16,436	102.6	55.9	55.9	102.6	
*U. S. S. R. . . . .	2,282	1,854	2,268	123.1	100.6	...	...	695,913	...	...	...	...	
-Syria and Lebanon	6	6	6	96.4	94.5	2,954	3,576	3,761	82.6	78.6	78.6	82.6	
Totals . . .	281	335	365	85.1	77.6	182,527	274,129	299,069	66.6	61.0	61.0	66.6	

*Fibre.*

*Germany (1) . . .	1	1	4	80.4	19.5	—	—	—	—	—	—	—	—
Austria . . .	1	1	(2) 1	80.4	80.9	(3) 1,301	(3) 1,789	(3) 1,770	72.7	73.5	75.5	72.7	73.5
Bulgaria . . .	9	9	10	102.6	94.3	4,139	3,299	3,028	127.0	133.3	138.3	127.0	133.3
France . . .	9	11	12	84.9	73.7	8,203	10,434	10,822	78.6	75.3	75.3	78.6	75.3
Italy . . .	160	214	236	74.8	67.9	125,959	201,400	222,033	62.5	56.7	56.7	62.5	56.7
Poland . . .	76	79	74	97.1	102.8	31,778	46,103	42,655	68.9	74.5	74.5	68.9	74.5
*Rumania . . .	120	83	101	145.3	118.9	...	37,323	36,741	...	...	...	...	...
Czechoslovakia . .	20	15	26	132.9	80.0	9,189	8,959	16,436	102.6	55.9	55.9	102.6	55.9
*U. S. S. R. . . .	2,282	1,854	2,268	123.1	100.6	...	...	695,913	...	...	...	...	...
-Syria and Lebanon	6	6	6	96.4	94.5	2,954	3,576	3,761	82.6	78.6	78.6	82.6	78.6
<b>Totals . . .</b>	<b>281</b>	<b>335</b>	<b>365</b>	<b>85.1</b>	<b>77.6</b>	<b>182,527</b>	<b>274,129</b>	<b>299,069</b>	<b>66.6</b>	<b>61.0</b>	<b>61.0</b>	<b>66.6</b>	<b>61.0</b>

*Hempseed.*

Austria . . .	(4)	(4)	1	82.9	61.5	154	198	266	78.0	58.1	58.1	78.0	58.1
Bulgaria . . .	9	9	10	102.6	94.3	3,668	2,324	2,525	157.9	145.2	145.2	157.9	145.2
France . . .	9	11	12	84.9	73.7	1,036	1,537	3,910	65.3	26.5	26.5	65.3	26.5
Italy . . .	160	214	236	74.8	67.9	7,542	10,375	13,563	69.3	55.6	55.6	69.3	55.6
Poland . . .	76	79	74	97.1	102.8	47,102	48,340	44,176	97.4	106.6	106.6	97.4	106.6
Czechoslovakia . .	20	15	26	132.9	80.0	6,097	6,340	11,776	96.2	51.3	51.3	96.2	51.3
*U. S. S. R. . . .	2,222	1,854	2,268	123.1	100.6	...	...	1,229,963	...	...	...	...	...
<b>Totals . . .</b>	<b>274</b>	<b>328</b>	<b>359</b>	<b>84.8</b>	<b>77.8</b>	<b>65,599</b>	<b>69,664</b>	<b>76,216</b>	<b>94.6</b>	<b>86.7</b>	<b>86.7</b>	<b>94.6</b>	<b>86.7</b>

\* Countries not included in the totals. — (1) Hemp and other textile plants. — (2) Average 1927 to 1929. — (3) Dried fibre. — (4) Area under 500 acres.

## SERICULTURE

COUNTRIES	QUANTITIES OF EGGS PREPARED FOR INCUBATION					PRODUCTION OF COCOONS				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930	Aver.				1930	Aver.
1,000 ounces					1,000 pounds					
Bulgaria . . . . .	20	44	40	45.8	50.4	2,646	4,995	4,388	53.0	60.3
Italy . . . . .	701	946	993	74.1	70.6	75,968	116,259	109,297	65.3	69.5
Korea. . . . . s)	222	225	185	98.6	120.2	27,605	28,404	19,053	97.2	138.4
Japon . . . . . { s)	2,807	2,790	2,560	100.6	109.6	435,419	463,825	386,083	93.9	112.8
Syria and Lebanon. . . . . { t)	2,985	3,339	3,537	87.9	83.0	332,562	416,356	371,804	79.9	89.4
	81	106	96	76.7	84.6	6,206	8,047	6,844	77.1	90.7
Total . . .	6,766	7,450	7,411	98.8	91.3	880,406	1,037,886	898,319	84.8	98.0

s) Spring cocoons. — t) Summer-autumn cocoons.

s) Spring cocoons. — d) Summer-autumn cocoons.

## TOBACCO

*French West Africa* : There has been a considerable extension of tobacco plantations in French Guinea.

*Algeria* : Sowings for next season have been large and the amount of land prepared leads to expectations of a considerable extension of the area under the crop.

*Tobacco.*

COUNTRIES	ARFA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver. = 100				1930 = 100	Aver. = 100
1,000 acres					1,000 pounds					
*Germany. . . . .	26	23	21	112.1	119.8	...	46,409	44,112	...	...
Belgium. . . . .	7	7	7	96.2	93.4	14,469	15,387	15,334	94.0	94.4
Bulgaria. . . . .	77	79	83	96.7	92.7	54,784	59,395	60,580	92.2	90.4
*Greece. . . . .	...	239	221	...	...	98,767	145,217	137,065	68.0	71.6
*Rumania . . . . .	40	85	77	46.8	51.6	...	53,012	42,445	...	...
Czechoslovakia . . . . .	22	18	14	125.7	157.4	27,778	22,095	16,342	125.7	170.0
*U. S. S. R. . . . .	405	248	210	163.7	193.2	—	—	—	—	—
*Canada . . . . .	...	41	37	...	...	48,230	36,717	34,774	181.4	138.7
United States . . . . .	2,020	2,101	1,776	96.1	113.7	1,610,098	1,635,210	1,859,631	98.5	118.4
Japan . . . . .	91	89	91	102.7	100.8	155,757	145,175	142,157	107.3	109.6
Syria and Lebanon. . . . .	21	10	7	207.9	278.4	12,092	6,960	4,959	173.7	243.8
Algeria . . . . .	57	57	65	98.8	89.8	39,723	43,488	54,233	91.3	73.2
*Tripolitania . . . . .	1	1	—	88.2	—	1,323	1,543 (1)	243	85.7	545.0
Madagascar . . . . .	22	32	17	68.7	129.9	17,637	13,519	17,503	95.2	100.8
Totals . . .	2,556	2,632	2,281	97.1	111.9	2,031,105	2,091,444	1,808,704	97.1	112.3

\* Countries not included in the totals. — (x) Average 1927 and 1928.

## HOPS

In the following table are assembled almost complete data on the area cultivated to hops and the production in 1931, with the figures for five preceding years and the mean of the last pre-war quinquennium for comparison.

*Areas cultivated to hops.*  
(in acres)

COUNTRIES	1931	1930	1929	1928	1927	1926	1909-1913
Germany . . . . .	25,326	32,307	37,620	37,741	38,319	35,013 (1)	54,789
Austria . . . . .	173	171	731	744	773	279	2,004
Belgium . . . . .	2,051	2,545	3,156	3,652	3,744	2,834	5,313
France . . . . .	6,437	8,169	10,510	11,515	11,883	10,940	17,073
England . . . . .	18,536	19,996	23,987	23,804	23,003	25,508	33,797
Hungary . . . . .	566	573	576	655	321	86 (2)	385
Poland . . . . .	—	—	6,264	8,678	5,609	4,562	10,969
Czechoslovakia . . . . .	30,352	38,450	41,331	30,624	31,131	25,012	38,507
Yugoslavia . . . . .	...	7,139	12,680	22,045	21,867	10,211	—
<i>Total Europe . . . *</i>	<i>96,000 *</i>	<i>114,000</i>	<i>137,000</i>	<i>148,000</i>	<i>137,000</i>	<i>115,000 *</i>	<i>175,000</i>
Canada . . . . .	...	949	1,164	1,050	1,038	593 (3)	887
United States . . . . .	21,400	10,499	24,901	26,201	24,600	20,802 (4)	44,695
<i>Total America . . . *</i>	<i>22,000</i>	<i>20,000</i>	<i>26,000</i>	<i>27,000</i>	<i>26,000</i>	<i>21,000</i>	<i>46,000</i>
<b>WORLD TOTAL (†) . . *</b>	<b>120,000 *</b>	<b>136,000</b>	<b>165,000</b>	<b>177,000</b>	<b>165,000</b>	<b>138,000 *</b>	<b>222,000</b>

(†) The totals are rounded to thousands of acres and include also Australia and New Zealand.

\* Figures partly estimated. — (1) 1911 to 1913. — (2) 1911 to 1915. — (3) 1920 and 1911. — (4) 1909.

As may be seen from the tables, the continuous fall in prices has not failed to exert an influence on the areas under hops. After having attained a maximum for post-war years in 1928, the area underwent a progressive decline in the succeeding years. In 1931 it was 32 % below the maximum, had fallen below the 1926 level and 46 % below the mean for the last pre-war quinquennium.

Production, after having attained its maximum in 1929, a year when areas were still extensive and meteorological conditions were very favourable in the majority of the large producing countries, also underwent a notable reduction in 1930 and still more in 1931. The 1931 crop was 41 % below the 1929 maximum, 18 % below the figure of 1926 and 41 % below the pre-war mean. It should be observed that part of the production, in Germany and France, was not picked owing to the inadequacy of prices.

*Production of Hops.*  
(in centials)

COUNTRIES	1931	1930	1929	1928	1927	1926	1909-1913
Germany . . . . .	(1) 137,018	243,865	300,745	184,457	158,273	55,623 (3)	231,140
Austria . . . . .	441	922	2,632	2,522	2,299	862	7,220
Belgium . . . . .	11,484	29,810	43,700	48,742	57,237	50,120	70,085
France . . . . .	(2) 13,318	64,371	137,763	90,976	111,680	88,811	136,941
England . . . . .	189,279	283,359	402,078	271,039	285,599	371,840	330,234
Hungary . . . . .	...	3,080	3,245	3,073	1,085	450 (4)	1,521
Poland . . . . .	—	—	38,422	38,025	37,920	25,794	51,368
Czechoslovakia . . . . .	247,254	324,641	260,584	207,991	239,224	213,159	—
Yugoslavia . . . . .	...	38,731	100,648	115,386	83,242	37,809	—
<i>Total Europe . . . *</i>	<i>680,000 *</i>	<i>1,027,000</i>	<i>1,290,000</i>	<i>962,000</i>	<i>977,000</i>	<i>844,000 *</i>	<i>1,120,000</i>
Canada . . . . .	...	11,960	14,447	9,672	14,280	9,685 (5)	11,283
United States . . . . .	253,519	234,469	332,200	329,440	306,580	315,220	516,587
<i>Total America . . . *</i>	<i>253,000</i>	<i>246,000</i>	<i>347,000</i>	<i>339,000</i>	<i>321,000</i>	<i>325,000</i>	<i>528,000</i>
<b>WORLD TOTAL (†) . . *</b>	<b>981,000 *</b>	<b>1,304,000</b>	<b>1,668,000</b>	<b>1,332,000</b>	<b>1,336,000</b>	<b>1,199,000 *</b>	<b>1,671,000</b>

(†) The totals are rounded to thousands of centials and include also Australia and New Zealand.

\* Figures partly estimated. — (1) Not including 34,502 centials not picked. — (2) Not including that part of the production not picked. — (3) 1911 to 1913. — (4) 1911 to 1915. — (5) 1920 and 1911.

Despite the diminution of production in 1930, the fall in prices, which had lasted almost without interruption since the first half of 1926, continued and in July-August of last year brought prices to their lowest level. Though there was a recovery in the last quarter of 1931, prices at the end of that year did not reach one-tenth of the average prices for 1926 and were more than two-thirds below the average prices for 1913.

*Hop Prices.*

		Price at Zatec in Kč. per 50 Kg.	Price at Nürnberg in RM. per 100 Kg.
Average	1926 . . . . .	3,979.50	1,014.17
»	1927 . . . . .	3,355.50	855.83
»	1928 . . . . .	1,955.00	458.33
»	1929 . . . . .	1,061.50	260.17
»	1930 . . . . .	670.00	174.18
January	1931 . . . . .	398.00	157.20
February	» . . . . .	398.00	128.00
March	» . . . . .	395.00	97.50
April	» . . . . .	382.50	82.50
May	» . . . . .	347.50	68.34
June	» . . . . .	282.50	65.00
July	» . . . . .	282.50	46.66
August	» . . . . .	210.00	—
September	» . . . . .	282.50	115.00
October	» . . . . .	357.50	101.00
November	» . . . . .	357.50	100.00
December	» . . . . .	315.00	94.26

This state of extreme market depression, which lasted even after the relatively poor production of 1931, is explained by the fact that large stocks had accumulated during the preceding years, and by the contraction of demand in 1930 and 1931, which, especially in the latter year, helped to keep back the movement of the supplies available on the world market.

The formation of these stocks has been the result of an excess of production over consumption. It is true that the area cultivated to hops has throughout the period under consideration remained at a level below that of pre-war and that total production has attained the pre-war level only once, in 1929, while the yearly average of quantities harvested from 1926 to 1929 has been 17% below the yearly average of 1909 to 1913. The reduction of consumption has, however, been much greater. It may be estimated that the average quantity of beer consumed throughout the world each year from 1926 to 1929 has been only two-thirds of that in 1913, which means a corresponding reduction in production of beer and in consumption of hops. The latter has been further diminished by modern processes of brewery utilisation of hops.

The most considerable reduction has been in the United States, following the introduction of Prohibition, but the figures of other countries where the brewing industry has most importance also show a very heavy decline.

In the United Kingdom, according to official statistics, beer production fell from 1,269 million Imperial gallons (1,524 million American gallons) in 1913 to 685 (823) million in 1929, that is, by 46 %; consumption, having fallen from 1,272 (1,527) million gallons to 735 (883) million was reduced in almost the same proportion (42 %).

In Germany beer production in 1929, estimated at 1,256,000 Imperial gallons (1,508,000 American gallons), was 14 % below that of 1913, estimated for the present territory of the Reich at 1,457,000 (1,749,000).

In Czechoslovakia the amount of beer leaving the breweries in 1929 — 255,000 (307,000) gallons — was still 5 % below the amount produced in 1912-13 on the territories now forming part of that country, 268,000 (322,000) gallons.

In Belgium the production of beer in 1929 — 338,000 (406,000) gallons — was 8 % below that in 1913 — 368,000 (442,000) gallons.

Amongst the most important consuming countries only France showed in 1929 a beer production greater than in 1913.

While the reduction of world consumption in relation to pre-war was still very considerable in 1929, a year in which, however, consumption attained the highest level of post-war years, there has been since then in almost all the principal producing countries a further reduction, in some cases very marked.

In the United Kingdom production in 1930 was 3 % inferior to that of 1929 and in the first nine months of 1931 was 10 % below that of the corresponding period in 1930.

In Germany the quantity produced in 1930 showed a reduction of 10 % on that of 1929, while that in the first nine months of 1931 was 23 % below that of the corresponding period of 1930.

In Czechoslovakia the quantities leaving breweries in 1930 showed a reduction of 2 % with respect to 1929 and in the first nine months of 1931 a reduction of 9 % with respect to the corresponding period of 1930.

\* \* \*

*France* : The abnormally poor production is due to three factors of unequal importance : a decline in yields owing to the attacks of mildew and rust, a relatively heavy reduction of area and, above all, the abandonment of part of the crop in Bas-Rhin, which is by far the principal producer : the last two factors are consequences of the severe depression due to poor sales.

## OTHER PRODUCTS

### Cacao.

*Gold Coast* : Favourable weather continued throughout the country in December. At the end of the month harvesting of the major crop was drawing to a close, some 5 % of the crop having still to ripen and 10-15 % having still to be picked. The end of the crop has in most districts been earlier than usual. After the last picking it was expected that there would be a long break in production as few districts had reported flower setting, a circumstance that indicates a late minor crop.

The crop in the Western and Eastern Provinces seemed likely to amount to the quantity forecasted. Latest reports from Ashanti showed that the crop had come in slightly better than had been anticipated. In the northern part of the Central Province, however, expectations had not been realised owing to unfavourable weather. The estimate for the total — 414.4 million pounds — was unchanged.

Slate continues to be the most prominent defect. Cacao from the second picking showed an increase in germinated beans and mould was beginning to appear in cacao that had been stored since the earlier part of the season.

Movement toward the ports was general, port shipments during the last two weeks of December showing a large increase. Larger stocks were, however, held up-country than normal at the time of year.

Crop movement has been as follows :

	December 1931 —	October- December 1931 —	December 1930 —	October- December 1930 —
Arrivals by rail at Takoradi and Accra (1000 lb.) . . . . .	70,912	138,206	27,310	66,644
Shipments from Takoradi and Accra (1000 lb.) . . . . .	59,351	106,689	28,560	78,172
Shipments from all ports (1000 lb.)	80,400	135,177	30,489	89,472
Stocks at Takoradi and Accra beach at end of December (1000 lb.)	51,175	—	...	—

## Tea.

*India* : In North India the weather during December last was seasonable and the crop had all been harvested ; statistics to the end of December recorded an increase of 4.04 million lbs. as compared with the outturn to the same date of the preceding year.

In South India cold and wet weather was experienced during December and crop prospects were considered fair ; the outturn was 4.34 % ahead of that to the same date of the preceding year.

## Coffee.

*Costa Rica* : It is reported in coffee circles that the crop for 1931-32 will be of fair size, probably 25 per cent. less than the last crop, which amounted to 463,000 centals.

*French West Africa* : The efforts made by the Administration in encouraging cultivation and distributing selected seed have led to an extension of the coffee plantations in Guinea, the Ivory Coast and Dahomey.

*Kenya* : Toward the end of December picking was nearing completion on the majority of estates. Dry weather conditions affected the coffee crop in the Nyeri District and bugs were reported to be very active in some areas, but the previous crop estimates are practically confirmed.

*Madagascar* : Plantings have decreased markedly in 1931-32 in relation to the preceding season and to the average of 1926-27 to 1929-30 : 98,800 acres against 159,600 (61.9 %) and 151,100 (65.4 %). On the other hand, owing to the coming into bearing of many young plantations the crop is very much greater than those of the preceding years : 220,000 centals against 147,000 — in 1930-31 (150 %) and 85,500 in the five years ending 1929-30. On 1 January 1932 crop condition was excellent.

## Groundnuts.

*India* : The final estimate of the area under groundnuts is 5,562,000 acres against 6,240,000 in 1930-31 and 5,164,000, the average of 1925-26 to 1929-30 ; percentages : 89.1 and 107.7. The corresponding figures of production (in centals) are : 60,413,000 ; 66,931,000 and 56,636,000 ; 90.3 % and 106.7 %.

*French West Africa* : The 1931 agricultural season was on the whole very good. Acreage was larger than in 1930 and yields were satisfactory so that production seems to have about equalled that of last year, which was excellent. In Senegal, which produces three-fourths of the total groundnut crop of French West Africa 11,685,000 centals was produced falling below that of 1930 (11,918,000 centals ; 98 %) by only 233,000 centals and exceeding the average of 1925-1930 (10,362,000) by 12.8 %.

## Colza, Sesamum and Mustard.

*Austria* : On 1 February crop condition of winter colza was 2.6 against 2.5 on 1 January this year and 1 February 1931.

*Belgium* : The latest estimate of production of colza in 1931 is 3,300 centals (6,600 bushels) compared with 2,500 (5,000) in 1930 and 8,600 (17,200), the average for the preceding quinquennium. Percentages : 131.2 and 38.3.

*Rumania* : The area sown to winter colza in the autumn of 1931 was 72,600 acres against 80,200 in autumn 1930 (90.5 %).



	1931	1930	Average 1925-29	Percentages 1931 = 100 1930	Average = 100
<i>Production in thousands of cents.</i>					
Annual green fodder. . . . .	295,276	277,526	256,298	106.4	115.2
Temporary meadows, leguminous	283,671	282,042	260,561	100.6	108.6
Temporary meadows, mixed. . .	35,138	36,120	29,371	97.3	119.6
Permanent meadows - . . . .	457,764	483,752	386,844	94.6	118.3
<i>Total hay and fodder . . . .</i>	<i>1,071,849</i>	<i>1,079,440</i>	<i>933,074</i>	<i>99.3</i>	<i>114.9</i>
Mangolds . . . . .	668,642	687,983	513,092	97.2	130.3
Fodder cabbage . . . . .	146,872	166,101	131,271	88.4	111.9
Turnips and swedes. . . . .	82,980	75,610	70,998	109.7	116.9
<i>Total fodder roots . . . .</i>	<i>898,494</i>	<i>929,694</i>	<i>715,361</i>	<i>96.6</i>	<i>125.6</i>
<i>Production in thousands of short tons.</i>					
Annual green fodder . . . . .	14,764	13,876	12,815	106.4	115.2
Temporary meadows, leguminous.	14,183	14,102	13,028	100.6	108.6
Temporary meadows, mixed. . .	1,757	1,806	1,469	97.3	119.6
Permanent meadows . . . . .	22,888	24,187	19,342	94.6	118.3
<i>Total hay and fodder. . . .</i>	<i>53,592</i>	<i>53,971</i>	<i>46,654</i>	<i>99.3</i>	<i>114.9</i>
Mangolds . . . . .	33,432	34,399	25,654	97.2	130.3
Fodder cabbage . . . . .	7,343	8,305	6,563	88.4	111.9
Turnips and swedes . . . . .	4,149	3,780	3,550	109.7	116.7
<i>Total fodder roots. . . .</i>	<i>44,924</i>	<i>46,484</i>	<i>35,767</i>	<i>96.6</i>	<i>125.6</i>

In a general way an examination of the data for area shows a tendency to reduction in permanent meadows, the extension of which had continued since the war; during 1930-31 the areas thus set free were devoted to annual fodder crops or to a short rotation. The extension of these uses may be attributed on the one hand to the favourable position of stock-rearing in 1930 and on the other to the growth in numbers of stock that has been a consequence of the reduction of cereal sowings caused by the very unfavourable weather. The serious intensification of the crisis in the French livestock industry and the very favourable weather having, however, led to an extension of autumn-winter sowings, it may be expected that this year will show a regression in fodder crops.

Production is abundant and will to a large extent cover fodder requirements of a head of stock probably below that of last year; quality of fodder crops is in many districts, however, not very satisfactory.

*Great Britain and Northern Ireland*: Except in the extreme north-west of England, where the weather was stormy and wet, conditions were very mild for the time of year. In some districts there was heavy rain at the beginning of the month and, while there was some frost, there was little wind to assist in drying the land. In Scotland turnips that had not been lifted continued to grow but it is probable that this crop will be short; pastures remained remarkably fresh and green for the season.

*Italy*: In January crops developed very well and in some areas first cuttings continued. Irrigated meadows have a good appearance. Manuring of fodder crops with chemical fertilisers and dung was carried out regularly. In many provinces there are complaints of scarcity of fodder.



In the following table is indicated the production of fodder crops in terms of ordinary hay compared with that of 1930 and the average for 1925-29.

	1931	1930	Average 1925-29	Percentages 1931 1930 = 100	Average = 100
	—	—	—	—	—
<i>Thousand of centals</i>					
Temporary meadows . . . . .	216,960	263,910	224,127	82.2	96.8
Grass . . . . .	37,040	41,903	30,891	88.4	119.9
Unirrigated permanent meadows. .	67,329	79,329	71,672	84.9	93.9
Irrigated permanent meadows . .	50,967	56,569	48,033	90.1	106.1
Permanent pastures . . . . .	53,751	64,009	60,682	84.0	88.6
Accessory fodder production . . .	90,844	105,617	79,748	86.0	113.9
Total . . .	516,891	611,337	515,154	84.6	100.3
<i>Thousand of short tons</i>					
Temporary meadows . . . . .	10,848	13,195	11,206	82.2	96.8
Grass . . . . .	1,852	2,095	1,545	88.4	119.9
Unirrigated permanent meadows .	3,366	3,966	3,584	84.9	93.9
Irrigated permanent meadows . .	2,548	2,828	2,402	90.1	106.1
Permanent pastures . . . . .	2,688	3,200	3,034	84.0	88.6
Accessory fodder production . . .	4,542	5,281	3,987	86.0	113.9
Total . . .	25,844	30,565	25,758	84.6	100.3

*Portugal*: The drought and frosts have seriously damaged the pastures, which carry very little grass. Livestock have greatly suffered.

*Czechoslovakia*: Area and production of fodder crops in 1931, compared with the figures for 1930, are as follows:

	1931	(000 acres)	1930	1930 = 100	
Area					
For fodder					
Mangolds . . . . .	284		190	149.7	
Green fodder . . . . .	337		285	118.5	
Clover and lucerne . . . . .	1,838		1,981	92.8	
Temporary meadows . . . . .	86		126	67.6	
Permanent meadows . . . . .	3,163		3,166	99.9	
For seed					
Red clover for two cuttings . . . . .	107		96	112.0	
Lucerne . . . . .	23		23	103.8	
Production					
	(1000 centals)		(1000 short tons)		
	1931	1930	1931	1930 = 100	
For fodder					
Mangolds . . . . .	70,727	49,825	3,536	2,491	142.0
Green fodder . . . . .	8,407	7,732	420	387	108.7
Clover and lucerne. . . . .	65,570	73,019	3,278	3,651	89.8
Temporary meadows . . . . .	3,039	4,443	152	222	68.4
Permanent meadows . . . . .	113,364	112,029	5,668	5,601	101.2
For seed					
Red clover for two cuttings. .	189	163	9	8	115.6
Lucerne . . . . .	61	56	3	3	110.0

*Canada* : The final figures of area and production of some of the chief fodder crops in 1931 in Canada, with relevant comparisons, are given below :

	1931	1930	Average 1925-1929	% 1931 1930 = 100	Av. = 100
<i>Area (thousand acres).</i>					
Grain hay . . . . .	1,800	1,798	1,645	100.1	109.4
Turnips, etc. . . . .	154	226	200	68.2	76.9
Alfalfa . . . . .	537	744	807	72.2	66.6
Hay and clover . . . . .	8,532	10,618	10,037	80.4	85.0
<i>Production.</i>					
Grain hay . . . (ooo centals)	72,260	63,180	76,856	114.4	94.0
(ooo short tons)	3,613	3,159	3,843		
Turnips, etc. . . (ooo centals)	29,371	41,064	37,520	71.5	78.3
(ooo short tons)	1,469	2,053	1,876		
Alfalfa . . . . (ooo centals)	26,840	32,800	38,581	81.8	69.6
(ooo short tons)	1,342	1,640	1,929		
Hay and clover (ooo centals)	279,200	327,940	314,953	85.1	88.6
(ooo short tons)	13,960	16,397	15,748		

The figures show that 1931 was a year of relatively small production of turnips, alfalfa and hay and clover as well as of fodder corn (see crop Report for last January). For all of these products acreage and production in 1931 were well below those of 1930 and the average ; the percentage reductions in production were in all cases less than those of acreage so that it may be stated that higher unitary yields were obtained from a smaller acreage. Grain hay is an exception as about the same acreage was cut as in 1930 ; yield per acre was higher than in the previous year but below the average.

*United States* : In the week ended on January 28 ranges and pastures continued in satisfactory condition east of the Great Plains. The Northwest and West had substantial snow cover.

*Palestine* : Irrigated bersim crops are good, but rain-sown areas show poor germination and are much retarded in growth. Sowing of vetch and oats for forage is concluded ; the crop is showing slow growth.

*Algeria* : Weather in January was mild with good insolation and some rain and favoured sprouting of grass in the pastures, of which the condition, rendered rather poor by the stormy weather of December, improved considerably.

*Egypt* : Weather conditions during January were not quite satisfactory to the development of bersim. The coldness of the weather on some days slightly impeded the growth of late-sown areas and caused the colouration of the leaf tips. Growth, however, soon recommenced. The first cutting in late areas and in the general cultivation is in progress. The second cutting in is in progress in the early-sown areas in Lower Egypt and of the general crop of the project land (permanently irrigated) in Upper-Egypt.

Crop condition of bersim on 1 January was 100 against 100 on 1 January 1932 and 1 February 1931.

## LIVESTOCK AND DERIVATIVES

## Condition of Livestock and Dairy Production.

*Germany* : In the following table are given the figures for the production and distribution of cow's milk during the last five years :

*Unit yields and total production.*

	1931	1930	1929	1928	1927	1926
Average annual yield per cow :						
(Imperial gallons)	488.3	488.3	488.3	488.3	461.9	418.0
(American gallons)	586.5	586.5	586.5	586.5	554.8	501.9
Average annual yield per goat :						
(Imperial gallons)	99.0	99.0	99.0	99.0	77.0	77.0
(American gallons)	118.9	118.9	118.9	118.9	92.5	92.5
Total production of cow's milk :						
	(in thousands)					
(Imperial gallons)	4,704,616	4,588,909	4,626,745	4,339,017	4,262,685	3,822,514
(American gallons)	5,649,821	5,510,867	5,556,304	5,210,769	5,119,102	4,590,496
Total production of goat's milk :						
(Imperial gallons)	202,377	219,975	243,513	208,757	225,035	244,085
(American gallons)	243,037	264,171	292,437	250,698	270,247	293,124
Total production of cow's and goat's milk :						
(Imperial gallons)	4,906,993	4,808,884	4,870,258	4,547,773	4,487,720	4,066,599
(American gallons)	5,892,858	5,775,038	5,848,742	5,461,467	5,389,348	4,883,620

*Distribution of the total milk production.*

For direct consumption (32 %) :						
(Imperial gallons)	1,570,185	1,538,729	1,558,526	. . .	1,436,000	1,301,309
(American gallons)	1,885,651	1,847,875	1,871,650	. . .	1,724,507	1,562,755
For the manufacture of butter and cheese (55 % in 1931, 1930, 1929, 1927 and 60 % in 1926) :						
(Imperial gallons)	2,698,879	2,644,985	2,678,642	. . .	2,468,345	2,439,946
(American gallons)	3,241,112	3,176,390	3,216,808	. . .	2,964,261	2,930,156
For feeding calves and goatkids (13 % in 1931, 1930 1929, 1927 and 8 % in 1926) :						
(Imperial gallons)	637,929	625,170	633,089	. . .	583,375	325,322
(American gallons)	766,095	750,773	760,284	. . .	700,581	390,682

*Belgium* : Health is very good.

*Irish Free State* : Supplies of fodder, roots and grain on hand at the end of January were considered adequate to meet requirements for the remainder of the winter.

Milk yields were rather below the normal for the season.

*Great Britain and Northern Ireland* : Winter keep was not heavily drawn upon in January and there is no doubt that there is a sufficient supply on hand for the remainder of the winter. In Scotland some descriptions of concentrated foods, such as wheat bran and dried brewers' grains, were scarce and relatively expensive.

Milk yields were below average in some districts in both England and Wales and Scotland but normal in Northern Ireland.

From Northern Ireland it is reported that the mild weather in January was of special benefit to cattle of all classes, which are in good condition. Though a few cases of fluke have occurred in some districts, sheep are in most areas in sound condition and good health.

*Hungary* : On about 10 January livestock were in good health except for some cases of swine disease.

It is estimated that fodder reserves will suffice to feed livestock during the winter.

*Canada* : The numbers of livestock slaughtered in Canada in 1931 compared with the previous two years are as follows :

	Cattle	Calves	Hogs	Sheep
1931 . . . . .	592,036	371,076	2,242,765	820,891
1930 . . . . .	602,007	376,237	1,926,325	745,119
1929 . . . . .	701,866	414,781	2,353,161	725,004

*United States* : In the week ended on 28 January livestock continued in satisfactory condition east of the Great Plains but in the plains area some shortage of feed was becoming apparent with consequent deterioration in parts. The Northwest and West have substantial snow cover and heavy feeding of livestock remains necessary with reports of feed becoming scarce in many north-central sections of the country. In the more western States livestock suffered from the severely cold weather, with some further losses reported. Stock vary from poor to excellent in the Southwest but in other western areas conditions are largely satisfactory.

*French West Africa* : In Mauritania an epidemic of pasteurellosis in 1931 caused the loss of a large part of the sheep flocks ; the loss reaches 60 % in some flocks. Cattle disease has also caused some damage but of a much less serious nature.

In Upper-Volta the epidemic of cattle disease and peripneumonia have caused rather large losses during 1931 ; in the single quarter July-September losses amounted to nearly 1,400 head.

In Senegal, the livestock situation improved considerably as regards health and maintenance because the pastures furnished more feed. In Dahomey and the Ivory Coast the situation was good.

*Algeria* : January marked the end of a cold and rainy period that had lasted throughout December and placed flocks in very bad condition.

Small epidemics caused some losses in one or two centres but health is generally satisfactory. Conditions have very considerably improved, the pastures having been renewed and supplying everywhere sufficient nourishment.

Lambing took place in January under good conditions, favoured by mild temperatures and absence of excessive humidity as well as by improvement in general condition of the ewes.

*French Morocco* : The livestock situation, though improved by the rains of January, leaves much to be desired.

*Union of South Africa* : The beneficial effects of the excellent rainfall during November were largely dissipated by the drought and exceptional heat of December. While intermittent and light showers occurred in the highveld areas of the Transvaal and Orange Free State, the intense heat dried up the grazing in other areas and in the Rustenburg district veld fires were even reported.

Heavy rains and floods were reported at the end of the year but the drought did not appear to have been generally broken.

Although cattle had fallen off in condition in the drought-stricken areas and further losses were experienced in the Natal Highveld, small stock were generally in fair to good condition. With the practical completion of shearing the blowfly pest abated considerably, though it was still troublesome in several districts. In the Northwest Cape general conditions were critical ; the water-supply was failing and trekking with sheep in search of fresh pasture had been necessary.

#### Number of pigs in Denmark.

Although the total number of pigs according to the census of 15 January 1932 again shows an increase of 5.9 % compared with 15 January 1931, the figures given in the following table seem to indicate a tendency to reduce production.

	15-I-1932	15-VII-1931	15-I-1931	15-VII-1930	25-VII-1929	15-VII-1928
Boars 4 months						
old and above .	30,000	31,000	27,000	24,309	18,766	18,004
Sows 4 months old						
' and above :						
In farrow . .	355,000	430,000	385,000	394,615	309,575	243,069
Not in farrow	195,000	192,000	189,000	191,572	123,994	101,190
Store pigs 4 months						
old and above .	1,320,000	1,146,000	1,179,000	1,020,148	775,160	733,127
Young pigs 2 to 4						
months old . .	1,932,000	1,864,000	1,769,000	1,619,001	1,285,322	1,256,132
Sucking pigs under						
2 months old. .	1,655,000	1,781,000	1,632,000	1,670,202	1,103,061	1,011,333
Total . . .	5,487,000	5,444,000	5,181,000	4,919,847	3,615,878	3,362,855

A comparison of the variations from January 1931 to January 1932 with those which have taken place from one year to another according to the censuses carried out since 1929 gives the following results:

*Percentage increase or decrease in relation to the number  
at the same date of the preceding year.*

Date	Store pigs 4 months old and above	Young pigs 2 to 4 months old	Sucking pigs under 2 months old	Total sows	Sows in farrow	Total swine
15 July 1929 . . . . .	+ 5.7	+ 2.3	+ 9.1	+ 25.9	+ 27.4	+ 7.5
15 July 1930 . . . . .	+ 31.6	+ 26.0	+ 51.4	+ 35.2	+ 27.5	+ 36.1
15 July 1931 . . . . .	+ 12.3	+ 15.1	+ 6.6	+ 6.1	+ 9.0	+ 10.7
15 January 1932 . . . . .	+ 12.0	+ 9.2	+ 1.4	- 4.2	- 7.2	+ 5.9

The total increase from January 1931 to January 1932 is relatively the smallest obtained from one year to another since 1929. It is particularly interesting to observe that this increase is due almost exclusively to the increase in the number of young pigs from 2 to 4 months old and in that of store pigs (for fattening) 4 months old and over whereas for sucking pigs under 2 months old the increase is very small and for sows there is a decrease due to the very large decrease in the number of sows in farrow.

The results of the last census demonstrate, therefore, that in Denmark as in other countries the depression of prices is at present inducing farmers to restrict production and that there is reason to anticipate that the continual increase recorded during recent years will be followed by a reduction in pig numbers.

### Livestock in France.

The last livestock census carried out at the end of 1930 reveals that a check to French livestock production occurred in that year, exception being made of mules, asses and pigs.

*The number of livestock in France in 1930 and previous years.*

Year	Cattle			Horses		Mules	Asses	Sheep		Goats	Pigs
	mature	one year old and over	under one year old	under three years old	three years old and over			over one year old	sheep and lambs under one year old		
1930 . . . . .	9,897	3,049	2,522	574	2,350	154	252	7,679	2,474	1,675	6,329
1929 . . . . .	9,727	3,033	2,371	641	2,345	143	234	7,877	2,575	1,855	6,102
1928 . . . . .	9,837	3,116	2,052	588	2,348	166	250	7,984	2,461	1,372	6,017
1927 . . . . .	9,693	3,137	2,112	585	2,342	183	260	8,151	2,542	1,405	6,019
1926 . . . . .	9,394	3,025	2,064	577	2,317	185	264	8,177	2,599	1,388	5,777
1925 . . . . .	9,276	3,002	2,095	576	2,305	188	273	8,019	2,518	1,373	5,793
1920 . . . . .	8,114	2,830	1,973	539	2,096	181	298	7,105	2,301	1,341	4,941
1913 . . . . .	9,922	2,854	2,012	672	2,550	188	356	12,163	3,908	1,435	7,036

The progress of pig raising seems to show a tendency which appeared to be permanent since there was not only an increase in the number of animals for fattening over six months old as a consequence of the previously favourable pork market, but an increase in the number of young pigs six months old and particularly in the number of sows which had remained unchanged since 1927. The latter increase would have justified the anticipation of an increase in the number of pigs except for the unsatisfactory market situation and the fall in prices which would normally have led to a decline in pig rearing.



The quantity of live cattle and carcasses imported during the year 1931 represents, according to the Meat Producers' Association, about 12 % of consumption whereas during the period 1927-30 it was hardly 1.2 %.

At the end of the past year prices were generally at an unremunerative level on all the French markets, particularly for fat cattle or cattle for fattening. The abundance of fodder reserves in October-November induced farmers to retain their stock through the winter in the hope of an improvement in spring prices but it is certain that at the beginning of 1931 marketing of slaughter cattle was relatively heavy and, in fact, a part cause of the crisis so that for 1931 a general reduction of French livestock may be expected which should be still more marked in 1932 owing to decrease of calvings.

*The movement of meat prices on the La Villette market during the year 1931.*

QUALITY	January- February	March- April	May- June	July- August	5 Oct.	5 Nov.	3 Dec.	7 Jan. 1932	14 Feb. 1932	Decrease January 1931- January 1932
	(francs per kg. of meat net — 2nd quality)									
										%
Beef, bullock . . .	10.57	9.80	9.50	9.43	8.30	8.10	6.80	7.10	6.90	—35 %
Beef, cow . . . . .	10.27	9.50	9.20	9.13	8.00	7.70	6.30	6.70	6.50	—37 %
Beef, bull . . . . .	9.40	8.47	8.27	8.20	7.20	6.80	5.80	6.30	5.70	—37 %
Veal . . . . .	14.20	13.47	12.93	11.57	9.50	8.80	8.00	12.10	11.70	—29 %
Mutton . . . . .	15.23	15.27	14.97	13.80	11.50	10.80	9.10	10.10	9.80	—37 %
Pork . . . . .	8.87	8.37	8.28	9.14	8.86	8.00	7.58	7.14	7.42	—17 %

*Average prices of good quality meat quoted by the producer in the principal centres of rearing and production.*

(Statistics of the Meat Producers' Association).

	March-April francs per kg. live weight		September-October francs per kg. live weight		November-December francs per kg. live weight	
	bullock	cow	bullock	cow	bullock	cow
Charollaise . . . . .	7.18	6.46	4.50	4.00	4.50	4.22
Limousine . . . . .	6.55	6.33	5.25	4.50	4.23	3.88
Normandy . . . . .	5.88	5.56	4.62	4.40	3.87	3.32
Brittany . . . . .	5.30	4.61	4.43	3.75	3.75	3.62
Maine-Anjou . . . . .	5.55	5.10	4.50	3.95	4.41	3.93
Salers . . . . .	5.47	4.80	4.12	3.70	3.85	3.42
General average for France	5.79	5.15	4.61	4.09	4.18	3.69

*Decrease relative to March-April.*

General average, bullock and cow . . . . . } September-October 20.2 %  
 . . . . . } November-December 28.2 %

In fact, despite the fixing of quarterly import quotas to meet current market requirements, which meant practically the total exclusion of the foreign product, the Meat Producers' Association estimates that production still exceeds the requirements of consumption and that it should be reduced to this level. The extremely low prices prevailing should to some extent lead to this end.

There was noted in December, moreover, a recovery in the market situation and a slight rise in quotations at the beginning of 1932.



### Livestock in Luxemburg.

In the following table are given the numbers of livestock in Luxemburg on 1 December 1931 compared with the figures of the triennial census in previous years and 1913.

	1-XII-1931	1-XII-1928	1-XII-1925	1-XII-1922	1-XII-1913
Classification :					
Horses . . . . .	16,967	18,145	18,323	17,192	19,158
Asses and mules . . . . .	154	248	287	254	32
Cattle . . . . .	98,901	98,519	100,925	82,852	101,793
Sheep . . . . .	7,733	9,767	10,563	3,714	5,310
Goats . . . . .	5,046	6,662	9,993	10,452	10,500
Pigs . . . . .	148,958	127,003	120,928	88,788	137,144
Fowls . . . . .	515,813	480,006	453,842	428,051	418,615
Geese . . . . .	7,186	8,132	7,271	5,561	4,816
Ducks . . . . .	5,633	6,653	6,215	3,769	4,927
Turkeys . . . . .	1,402	1,225	1,238	553	599
Beehives . . . . .	10,723	11,087	11,385	11,420	12,501
Rabbits . . . . .	48,067	47,432	26,425	9,245	36,202

It will be seen from the above table that the number of horses has decreased by 6.5 % compared with 1928 ; sheep and goats show more marked decreases of 20.8 % and 24.3 per cent. respectively ; asses and mules show the largest reduction — 37.9 % — although their actual number is still five times larger than in the pre-war period.

The number of cattle has remained practically unchanged (+ 0.4 %) and is still below the pre-war figure. Fowls have increased uninterruptedly in number with a 7.5 % increase on 1928 ; there is a particularly large relative increase in turkeys, the figure for 1931 being 14.5 % above that of 1928 and over double that of 1913. The increase in the number of pigs, thanks to heavy production, has continued to increase and reaches 17.3 % compared with 1928.

### Livestock on farms in the United States.

The total number of cattle and calves in the United States on January 1, 1932 (62,407,000 head) showed a further increase compared with the revised figure of 60,915,000 head at the beginning of the previous year. The number of beef cattle, which is still at a low level compared with that at the beginning of the last decade, increased by about 783,000 head (+ 2.4 %) and cows and heifers 2 years old and over kept for milk increased by 821,000 head (+ 3.5 %), whereas heifers 1 to 2 years old kept for milk showed a decrease of 112,000 head from 4,777,000 on January 1, 1931 to 4,665,000 on January 1, 1932 (— 2.3 %). The total increase in dairy cattle is therefore 709,000 head which is smaller than the increase in beef cattle.

The chief factor in the beef situation during the year was the reduction of consumer-demand as a result of the general economic crisis and the consequently low prices received by producers.

(Thousand head).

Year (1)	Horses and horse colts	Mules and mule colts	Cattle and calves		Sheep and lambs (3)	Swine including pigs
			Total	of which cows and heifers (2)		
1931 . . . . .	12,670	5,082	62,407	24,379	53,912	59,511
1930 . . . . .	13,165	5,215	60,915	23,558	52,745	54,374
1929 . . . . .	13,684	5,366	59,730	22,910	51,383	55,301
1928 . . . . .	13,897	5,389	56,389	21,849	47,704	57,410
1927 . . . . .	14,495	5,504	55,676	21,828	44,795	60,617
1926 . . . . .	15,133	5,652	56,832	21,801	41,881	54,788
1925 . . . . .	15,830	5,740	59,122	22,188	39,730	52,148
1924 . . . . .	16,470	5,725	61,996	22,481	38,112	55,568
1923 . . . . .	17,222	5,730	64,507	22,255	36,876	66,361
1922 . . . . .	17,943	5,702	66,156	22,063	36,212	69,044
1921 . . . . .	18,564	5,638	67,264	21,788	36,186	59,559

(1) January 1 of the year after that given in the table (Jan. 1, 1932, Jan. 1, 1931, etc.).

(2) 2 years old and over kept for milk.

(3) Including estimates on sheep and lambs on feed for market as well as on farms.

In the 1930-31 season production seems to have been favoured by the surplus of low-priced grain and feeding stuffs and a favourable ratio between feed prices and cattle prices but on the other hand cattle feeding for market has been discouraged by shortage of credit and a lack of confidence in cattle feeding on the part of both bankers and feeders because of the heavy losses sustained from feeding operations during the last two years. In fact shipments of stocker and feeder cattle into the Corn Belt States through public markets for the five months July to November were about the same as in 1930 but the lowest since 1920 with the exception of 1927 and the number of cattle on feed for market was smaller on January, 1, 1932, than a year earlier. As regards the 1931-32 season, supplies of feed grains and feeding stuffs are slightly below the average but much in excess of those available last year while supplies of hay are less than a year ago and below average. As far as feed supplies and prices are concerned, therefore, prospects appear to favour cattle production but feeders are still restricted by shortage of credit. A factor which must be taken into account is the likelihood of large supplies of other meats, pork, mutton and lamb in the coming season. Some indication of the situation of supplies and prices of beef, veal and butter may be obtained from the following summary :

*Average price received by producers (1).*

	Thousand head slaughtered under Federal inspection		For beef	For veal	For
	Cattle	Calves	\$ per 100 lb.	\$ per 100 lb.	butter cents per lb.
1931 . . . . .	8,108	4,717	5.38	7.03	28.0
1930 . . . . .	8,170	4,595	7.55	9.90	37.0
1929 . . . . .	8,324	4,489	9.22	12.18	44.0

*Fall in average prices.*

	Beef cattle	Veal calves	Butter
From 1929 to 1930 . . . . .	17.1 %	18.7 %	15.9 %
From 1930 to 1931 . . . . .	28.7 %	29.0 %	24.3 %

(1) Simple average of monthly prices.

It is seen that prices of beef cattle and veal calves continued to fall sharply in 1931 although slaughter was not much larger than in 1930 and the quantity of beef in storage on January 1, 1932 was quite low; the average weight of the animals slaughtered in the first eleven months was, however, rather above that of the same period of 1930 and the average. It appears that relatively more calves including heifers were slaughtered during 1931 than during 1930, due probably to the difficult financial situation and the desire to realise quickly. Towards the end of the year there was also evident a tendency to feed lightweight steers and calves. Slaughter of cows was small. As regards the prices of dairy products in the last few years it is seen from the above summary that butter prices have fallen relatively less than beef prices and in fact the dairy industry is in a relatively more favourable position than most other agricultural lines.

The large increase in the number of hogs on farms on January 1, 1932 compared with that at the same date of the previous year, marks the beginning of the upward trend of the third complete hog cycle since 1920. The average corn-hog ratio for 1931 showed a further rise to 11.8 as compared with 11.3 in the previous year; this favourable movement in the ratio is due to the fact that although hog prices fell greatly during 1931, the fall in maize prices was relatively larger.

Year	Number of hogs (thousand head) (1)	* Slaughtering under F. I. (thousands)	Average price of hogs received by producers (dollars per 100 lbs.) (2)	Average price of maize received by producers (cents per bushel) (2)	Number of bushels of corn equal in value to 100 lbs. of hogs
1931 . . . . .	59,511	44,772	5.89	49.8	11.8
1930 . . . . .	54,374	44,266	8.82	78.0	11.3
1929 . . . . .	55,301	48,445	9.44	87.6	10.8
1928 . . . . .	57,410	49,795	8.75	80.1	9.8
1927 . . . . .	60,617	43,633	9.68	78.8	12.3
1926 . . . . .	54,788	40,636	11.80	69.9	16.0
1925 . . . . .	52,148	43,043	11.00	99.9	11.0
1924 . . . . .	55,568	52,873	7.48	91.2	8.2
1923 . . . . .	66,361	53,334	7.13	80.2	8.9
1922 . . . . .	69,044	43,114	8.40	59.6	14.1
1921 . . . . .	59,550	38,982	7.84	56.8	13.8

(1) On January 1 of the year after that given in the table (Jan. 1, 1932 Jan. 1, 1931, etc.). — (2) Simple average of monthly prices.

Consequently, as feeding prices were favourable and consumer demand was reduced by the general fall of purchasing power, the number of hogs slaughtered in 1931 was only very slightly above the rather low level of the previous year and well below the average slaughter of 1928-1930. This, together with the fact that the total pig crop of 1931 was about 9 % larger than that of 1930, explains the increased number of hogs in existence on January 1, 1932. The low prices obtained for hogs were due principally to reduced demand on the part of the consumer and partly to the more than seasonal increase in market supplies at the end of the year as a result of reduced exports to Europe where production had expanded; throughout most of the year however, supplies were not excessive. At the end of the year pork stocks were not excessive and the market was apparently stable. Prospects for the spring pig crop of 1932 also indicate an increase for the United States compared with the previous year as the number of sows expected to farrow next spring is estimated, after making the usual statistical allowances for the differences in past years between preliminary and final estimates, to be 2% larger.

The number of sheep and lambs at the beginning of 1932 reached a new record of 53,912,000 head, continuing the tendency to expansion noted in the last decade. The 1931

lamb crop was 8 % larger than that of 1930 and although slaughter was very heavy compared with previous years, the beginning of 1932 saw an increase in flocks. A gradual upward trend in the demand for lamb and mutton prevailed from 1922 to 1929 but since the latter year the decrease in consumer incomes has resulted in a check to demand. In view of these facts and of the large supplies placed on the market during 1931, it is not surprising therefore, that prices showed a further fall during the year and the low level of prices did not suffice to increase demand enough to absorb the expanded supplies; producers received for 100 lbs. sheep on January 15, 1931, 4.04 dollars (6.91 on January 15, 1930) and on December 15, 1931, 2.52 dollars (3.96 on December 15, 1930); lamb prices in dollars per 100 lbs. fell from 6.30 on 15 January 1931 (11.10 on 15 January 1930) to 4.19 on December 15, 1931 (6.18 on 15 December 1930). A further unfavourable feature is that world wool production continued to be large; the fall in wool prices in the United States was, however, checked in the latter half of 1931 by the increased activity of the textile mills. As regards the type of sheep marketed, there was little incentive to shear due to low wool prices and the desire was to realise quickly so that the tendency was to market lightweight animals. There was also evident an encouraging tendency to slaughter more ewe lambs and to reduce breeding flocks. The number of sheep and lambs on feed for market in the principal feeding States on January 1, 1932, was 6,186,000 or 14 % larger than the revised estimate of 5,428,000 head on feed on January 1, 1931.

The numbers of horses and mules continued to fall in 1931 and average values per head on January 1, 1932, were much lower than at the same date of the previous year; horses \$53.37 against \$60.43 and mules \$60.69 against \$69.17.

It appears that the demand for horses has recently improved as farmers today have not the ready cash to pay out for fuel and repairs of tractors; in fact, as production of horses has declined considerably in past years, the supply is at present rather inadequate. It is noteworthy in this connection that prices of horses in 1931 declined only half as much as those of all farm products. Judging by these facts a check to the decline in production of horses seems possible in the near future.

R. J. P.

### New Zealand lambing estimate.

The following table gives the estimate of the current season's lambing computed from estimated average percentages, with corresponding figures for the five preceding years, together with the actual number of lambs tailed, for comparison.

YEARS	Number of Breeding-ewes (thousands)	Estimated Average Percentage of Lambing	Estimated Number of Lambs (thousands)	Actual Number of Lambs tailed (thousands)
1931 . . . . .	17,600	86.79	15,281	...
1930 . . . . .	17,564	83.77	14,714	...
1929 . . . . .	16,008	83.65	14,722	14,888
1928 . . . . .	15,534	86.09	13,373	13,856
1927 . . . . .	14,832	86.76	12,869	13,179
1926 . . . . .	13,948	84.57	11,795	12,070

The number of breeding ewes has shown a continuous increase since 1920 thanks to a growing demand for lamb products in the British market and to improvements in grass-land management. Falling prices have, however, compelled farmers to increase sales

in order to maintain their income and this, in conjunction with the fact that the tendency to keep mature ewes longer had caused an accumulation of the number due for killing, has caused a slowing down in the rate of increase of breeding ewes, as indicated by the 1931 figures. This diminished rate of increase in the number of breeding ewes has, however, been to some extent compensated by the high lambing percentage, which approaches the 1929 record, with the result that the number of lambs expected was 3.9 per cent. above the corresponding figure in 1930 and exceeded the bumper lamb crop of 1929. The large number of lambs is of great importance for the economic utilisation of grassland, ensuring the full use of the spring flush of grass. The number of breeding ewes has continued to increase in the South Island but there is a decrease in the North Island. The lambing percentage continues, as in the previous three years, to be higher in the South Island than in the North Island, though the increase in the percentage in 1931 was greater in the latter than in the former.

## TRADE

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Wheat. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	322	24	0	0	2,043	827	0	0	3,234	0
Hungary . . . . .	873	503	0	0	6,219	3,492	0	0	5,217	0
Lithuania . . . . .	0	136	0	0	2	201	0	0	545	0
Rumania . . . . .	842	492	0	0	18,504	6,270	0	4	8,075	7
U. S. S. R. . . . .	...	...	—	—	(1) 22,919	(1) 14,017	—	—	67,735	—
Yugoslavia . . . . .	681	159	0	0	6,292	2,727	0	0	3,247	0
Canada . . . . .	13,413	13,338	9	2	56,987	77,215	44	24	137,150	79
United States . . . . .	4,738	1,627	483	798	27,957	26,068	3,697	5,900	49,229	11,016
Argentina . . . . .	4,438	2,513	—	—	18,036	10,216	—	—	71,553	—
Chile . . . . .	0	9	0	0	2	401	0	0	428	0
Turkey . . . . .	64	22	0	0	265	154	0	7	265	7
Algeria . . . . .	...	...	...	...	(2) 1,221	(2) 3,655	(2) 681	(2) 71	5,706	1,371
Tunis . . . . .	128	82	51	71	1,539	1,219	196	119	3,704	542
Australia . . . . .	4,193	4,301	0	0	16,301	13,812	0	0	70,505	0
<i>Importing Countries:</i>										
Germany . . . . .	1,140	128	1,708	721	6,288	190	7,231	8,450	265	18,805
Austria . . . . .	0	2	911	463	0	84	3,038	1,744	86	5,315
Belgium . . . . .	121	75	2,641	2,487	1,964	170	14,418	13,342	2,079	30,082
Denmark . . . . .	0	0	864	445	9	15	5,393	1,649	35	4,877
Spain . . . . .	0	2	0	0	0	4	35	0	4	0
Estonia . . . . .	0	0	18	2	0	137	0	245	0	370
Irish Free State . . . . .	...	...	...	...	(2) 0	(2) 7	(2) 2,520	(2) 2,432	18	6,435
Finland . . . . .	0	0	37	18	0	0	212	18	0	90
France . . . . .	4	2	2,635	2,185	0	944	20,362	14,802	906	46,606
Gr. Brit. and N. Ir. . . . .	79	79	8,545	15,510	243	324	68,795	59,046	683	124,551
Greece . . . . .	0	0	1,065	977	0	0	5,895	5,512	0	14,233
Italy . . . . .	0	0	847	3,761	18	22	3,382	20,741	18	50,116
Latvia . . . . .	0	0	31	60	0	0	245	562	0	1,030
Norway . . . . .	—	—	317	366	—	—	1,501	1,755	—	3,126
Netherlands . . . . .	4	2	1,583	871	31	42	6,834	7,445	683	16,569
Poland . . . . .	24	201	143	2	220	996	263	26	1,847	49
Portugal . . . . .	—	—	60	20	—	—	465	104	—	1,316
Sweden . . . . .	0	2	384	238	0	24	1,581	1,733	31	2,879
Switzerland . . . . .	2	0	1,300	805	2	0	6,530	5,324	2	11,086
Czechoslovakia . . . . .	0	0	1,519	1,587	2	2	6,607	4,484	4	7,079
British India . . . . .	11	37	0	487	146	1,880	179	1,376	2,251	6,687
Japan . . . . .	—	—	1,089	1,138	—	—	4,440	3,827	—	15,311
Syria and Lebanon . . . . .	53	9	7	22	392	95	7	33	137	44
Egypt . . . . .	...	...	...	...	(2) 0	(2) 2	(2) 106	(2) 223	2	1,019
Union of South Africa . . . . .	...	...	...	...	(3) 0	(3) 388	(3) 340	0	1,801	0
New Zealand . . . . .	...	...	...	...	(2) 0	(2) 15	(2) 40	0	123	0
<b>Totals . . . . .</b>	<b>31,130</b>	<b>23,825</b>	<b>26,367</b>	<b>33,042</b>	<b>188,601</b>	<b>165,625</b>	<b>165,196</b>	<b>161,978</b>	<b>439,634</b>	<b>383,635</b>
<b>Rye. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	403	44	522	79	1,803	1,142	1,874	317	1,213	690
Bulgaria . . . . .	68	121	0	0	818	600	0	0	1,413	0
Hungary . . . . .	201	280	0	0	774	851	0	0	1,579	0
Poland . . . . .	172	386	49	0	1,049	4,004	99	0	5,880	2
Rumania . . . . .	152	132	0	0	1,387	602	0	0	1,279	0
U. S. S. R. . . . .	...	...	—	—	(1) 4,409	(1) 2,132	—	—	15,794	—
Canada . . . . .	701	348	0	0	1,508	622	0	0	1,171	0
United States . . . . .	0	0	—	—	24	46	—	—	90	—
Argentina . . . . .	146	2	—	—	505	207	—	—	992	—
Turkey . . . . .	82	15	0	0	293	218	0	0	388	0
Algeria . . . . .	...	...	...	...	(2) 9	(2) 18	(2) 0	(2) 0	35	0
<i>Importing Countries:</i>										
Austria . . . . .	0	2	236	269	0	9	756	701	9	2,205
Belgium . . . . .	18	0	143	324	216	11	1,151	1,088	126	3,739
Denmark . . . . .	0	0	525	1,142	0	0	2,092	3,979	4	7,103
Estonia . . . . .	0	0	0	9	0	0	7	46	0	194
Finland . . . . .	0	0	9	4	0	0	282	1,193	2	1,570
France . . . . .	0	0	146	79	0	0	769	459	0	1,378
Italy . . . . .	0	0	13	64	0	0	55	306	0	597
Latvia . . . . .	0	0	7	9	0	0	51	146	0	260
Lithuania . . . . .	0	37	0	0	0	55	2	0	163	0
Norway . . . . .	0	0	414	360	0	0	1,790	1,283	0	3,023
Netherlands . . . . .	2	51	181	714	150	79	2,083	2,379	791	6,328
Sweden . . . . .	0	0	119	24	0	0	505	378	4	520
Switzerland . . . . .	0	0	4	18	0	0	44	97	0	174
Czechoslovakia . . . . .	0	60	946	58	4	862	3,655	108	476	844
<b>Totals . . . . .</b>	<b>1,943</b>	<b>1,478</b>	<b>3,314</b>	<b>3,154</b>	<b>12,949</b>	<b>10,958</b>	<b>15,315</b>	<b>12,425</b>	<b>31,389</b>	<b>28,622</b>

(1) (2) (3) See notes page 141.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1- December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Wheat flour. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	13	4	20	11	33	112	79	79	123	233
Belgium	4	22	4	26	31	79	35	117	216	281
Bulgaria	53	13	0	0	317	71	0	0	220	0
Spain	4	7	0	0	13	22	0	0	75	0
France	368	527	11	66	2,800	2,564	115	317	7,350	569
Hungary	364	529	0	0	1,373	2,635	0	0	4,008	0
Italy	381	187	40	13	1,067	558	134	77	1,179	225
Latvia	0	9	0	0	0	49	0	0	73	2
Lithuania	4	2	0	0	13	9	0	0	24	0
Poland	46	65	0	2	328	322	2	11	615	24
Rumania	...	...	...	...	(2) 256	(2) 227	0 (2)	0	441	0
Yugoslavia	24	13	0	0	51	62	0	2	84	2
Canada	884	1,179	4	2	5,027	6,973	18	24	13,113	49
United States	1,753	1,748	0	0	7,617	11,795	0	2	28,164	2
Argentina	93	163	—	—	584	847	—	—	2,044	—
Chile	2	18	0	0	7	82	0	0	104	0
India	84	146	0	0	403	470	0	2	1,032	1
Turkey	0	2	0	2	0	20	4	9	29	21
Japan	163	205	9	18	966	1,457	60	143	3,472	212
Algeria	...	...	...	...	(2) 40	(2) 152	(2) 15	(2) 9	267	57
Tunis	7	29	2	0	55	110	9	7	251	11
Australia	1,012	820	0	0	6,451	4,202	0	0	10,404	0
<i>Importing Countries:</i>										
Austria	2	0	152	333	7	2	500	1,027	18	3,100
Denmark	0	2	134	137	7	13	675	758	24	1,572
Estonia	0	0	2	9	9	0	11	55	2	88
Irish Free State	...	...	...	...	(2) 11	(2) 18	(2) 1,351	(2) 1,303	40	3,896
Finland	0	0	77	51	0	0	955	1,296	0	2,150
Gr. Britain and N. Ir.	456	346	1,032	1,116	2,242	2,048	5,307	6,078	4,608	12,316
Greece	0	0	11	13	0	0	46	95	0	185
Norway	4	0	183	46	7	2	761	670	2	1,396
Netherlands	4	11	55	320	37	49	395	1,713	115	3,845
Portugal	—	—	9	20	—	—	86	75	—	218
Sweden	0	0	4	7	0	2	18	46	2	71
Czechoslovakia	0	2	121	571	4	7	514	2,346	11	2,432
Ceylon	—	—	53	42	—	—	192	216	—	445
Java and Madura	—	—	...	...	—	—	(2) 423	(2) 337	—	1,025
Indo-China	—	—	33	42	—	—	174	198	—	428
Syria and Lebanon	13	2	20	29	68	2	128	79	22	163
Egypt	...	...	...	...	(2) 0	(2) 0	(2) 1,177	(2) 1,182	0	3,560
Union of South Africa	...	...	...	...	(3) 0	(3) 4	(3) 7	(3) 106	11	265
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 71	(2) 66	2	234
<b>Totals</b>	<b>5,738</b>	<b>6,054</b>	<b>2,035</b>	<b>2,876</b>	<b>29,824</b>	<b>34,965</b>	<b>13,262</b>	<b>18,445</b>	<b>73,149</b>	<b>39,299</b>
<b>Barley. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria	44	170	0	0	375	899	0	0	1,568	0
Spain	0	24	0	0	4	93	0	0	152	0
Hungary	2	90	0	0	44	390	0	0	580	4
Lithuania	0	0	0	0	0	7	0	0	15	0
Poland	309	306	0	0	2,108	1,856	0	0	2,798	0
Rumania	1,510	4,449	0	0	12,412	23,080	0	0	33,442	4
Czechoslovakia	243	567	0	0	851	2,608	2	2	3,008	4
U. S. S. R.	...	...	—	—	(1) 7,055	(1) 5,249	—	—	23,885	—
Canada	1,058	353	0	0	3,649	1,217	0	0	9,240	0
United States	112	428	—	—	1,336	2,546	—	—	5,022	—
Argentina	108	547	—	—	509	1,627	—	—	5,701	—
Chile	18	26	0	0	60	22	0	0	536	0
India	18	26	0	0	183	2	0	0	306	2
Syria and Lebanon	181	0	0	2	351	262	46	4	869	7
Turkey	93	51	0	0	1,534	119	0	0	598	0
Algeria	392	26	0	0	(2) 441	(2) 833	(2) 1,585	(2) 4	1,444	465
Egypt	...	...	...	...	(2) 0	(2) 2	(2) 187	(2) 26	2	152
Tunis	2	9	35	24	119	154	467	154	220	890
Australia	212	170	0	0	309	459	0	0	1,552	0
<i>Importing Countries:</i>										
Germany	4	18	1,539	2,076	11	60	5,648	6,874	62	17,906
Austria	0	0	308	198	0	0	1,175	948	0	2,077
Belgium	172	13	1,091	1,188	681	57	5,007	4,684	1,078	10,588
Denmark	60	134	262	2,079	262	582	2,059	7,464	1,232	15,007
Estonia	—	—	0	0	—	—	0	13	—	15
Irish Free State	...	...	...	...	(2) 13	(2) 13	(2) 15	(2) 9	20	45
France	2	4	1,228	855	11	11	4,506	2,989	22	7,621
Gr. Britain and N. Ir.	2	2	1,512	3,136	7	11	9,345	10,723	68	13,691
Greece	—	—	2	15	—	—	7	51	—	78
Italy	0	0	117	97	0	0	637	363	0	725
Latvia	0	0	0	40	0	0	4	121	0	202
Norway	0	0	146	185	0	0	454	484	0	1,078
Netherlands	24	24	776	1,332	112	128	4,863	7,068	591	14,716
Switzerland	0	0	514	245	0	0	1,550	1,182	0	2,329
Yugoslavia	2	0	0	20	11	11	83	101	29	136
<b>Totals</b>	<b>4,510</b>	<b>7,429</b>	<b>7,528</b>	<b>12,099</b>	<b>32,443</b>	<b>42,896</b>	<b>37,290</b>	<b>43,194</b>	<b>93,558</b>	<b>93,257</b>

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Oats. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	2	13	9	55	4	203	170	100	220	1,005
Irish Free State . . . . .	...	...	...	...	(2)	37 (2)	115 (2)	132 (2)	88	254
Hungary . . . . .	0	2	2	7	2	9	2	7	13	141
Lithuania . . . . .	2	11	0	0	2	51	0	0	84	0
Poland . . . . .	4	9	0	0	15	84	0	0	137	0
Rumania . . . . .	18	229	0	0	205	1,155	0	0	1,766	0
Czechoslovakia . . . . .	77	152	0	0	234	604	53	4	710	143
U. S. S. R. . . . .	...	...	...	...	...	...	...	...	10,726	...
Yugoslavia . . . . .	0	0	0	4	0	0	0	73	2	86
Canada . . . . .	419	227	22	2	1,744	602	536	229	2,650	234
United States . . . . .	24	0	0	4	617	71	4	22	130	198
Argentina . . . . .	851	987	...	...	4,209	4,500	...	...	14,621	...
Chile . . . . .	35	62	0	0	104	882	0	0	2,178	0
Algeria . . . . .	...	...	...	...	(2)	51 (2)	419 (2)	258 (2)	1,202	225
Tunis . . . . .	4	33	0	9	121	344	0	9	545	9
<i>Importing Countries:</i>										
Austria . . . . .	0	0	152	216	0	2	611	765	2	2,227
Belgium . . . . .	0	0	24	207	2	0	454	1,691	4	3,494
Denmark . . . . .	4	0	29	95	35	2	251	357	20	1,270
Estonia . . . . .	0	0	0	0	0	0	7	26	0	159
Finland . . . . .	4	0	0	37	11	0	40	57	7	280
France . . . . .	0	2	05	185	2	7	542	926	20	2,213
Gr. Brit. and N. Irel. . . . .	2	4	608	1,054	20	20	3,766	4,645	397	10,697
Italy . . . . .	0	0	481	606	0	0	1,437	1,795	0	3,741
Latvia . . . . .	0	0	0	0	0	0	7	13	4	57
Norway . . . . .	0	0	37	0	0	0	123	0	4	4
Netherlands . . . . .	7	9	203	445	24	24	895	1,477	375	3,000
Sweden . . . . .	0	0	66	99	2	11	626	432	40	1,334
Switzerland . . . . .	0	0	516	507	0	0	2,050	1,907	2	4,564
Australia . . . . .	7	4	0	0	24	29	0	0	73	2
<b>Totals . . . . .</b>	<b>1,460</b>	<b>1,703</b>	<b>2,244</b>	<b>3,532</b>	<b>7,531</b>	<b>9,210</b>	<b>11,964</b>	<b>14,735</b>	<b>36,385</b>	<b>36,124</b>

**Maize. — Thousand centals (1 cental = 100 lbs).**

COUNTRIES	TWO MONTHS (November 1-December 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1930-31
<i>Exporting Countries:</i>						
Bulgaria . . . . .	245	377	0	0	291	787
Rumania . . . . .	4,350	1,836	0	0	8,468	4,059
Yugoslavia . . . . .	238	1,108	2	4	370	1,845
United States . . . . .	40	29	33	64	287	88
Argentina . . . . .	20,731	12,584	...	...	41,632	23,060
Brazil . . . . .	...	...	...	...	(2)	0 (2)
Java and Madura . . . . .	...	...	...	...	(2)	44 (2)
Indo-China . . . . .	494	573	...	...	858	1,316
Syria and Lebanon . . . . .	2	13	2	2	4	26
Egypt . . . . .	...	...	...	...	(2)	0 (2)
Union of South Africa . . . . .	...	...	...	...	...	...
<i>Importing Countries:</i>						
Germany . . . . .	0	0	1,301	575	0	0
Austria . . . . .	0	0	798	467	0	0
Belgium . . . . .	46	22	2,035	1,164	86	44
Denmark . . . . .	0	0	2,251	681	0	0
Spain . . . . .	0	0	353	388	0	0
Irish Free State . . . . .	...	...	...	...	(2)	0 (2)
Finland . . . . .	0	0	35	11	0	0
France . . . . .	0	4	2,340	1,893	2	11
Gr. Brit. and N. Ir. . . . .	304	205	7,826	4,127	500	388
Greece . . . . .	...	...	...	...	...	...
Hungary . . . . .	13	68	37	13	...	...
Italy . . . . .	0	0	24	42	37	119
Norway . . . . .	...	...	950	1,574	0	2
Netherlands . . . . .	9	57	3,882	2,948	18	71
Poland . . . . .	0	0	22	15	0	0
Portugal . . . . .	...	...	157	302	...	...
Sweden . . . . .	...	...	755	443	...	...
Switzerland . . . . .	0	0	379	240	0	0
Czechoslovakia . . . . .	0	0	1,775	886	0	0
Canada . . . . .	2	2	675	439	4	2
Japan . . . . .	...	...	214	115	...	...
Tunis . . . . .	0	0	106	64	0	0
<b>Totals . . . . .</b>	<b>26,534</b>	<b>16,938</b>	<b>26,261</b>	<b>16,797</b>	<b>52,619</b>	<b>31,838</b>

(2) See notes page 141.



COUNTRIES	DECEMBER				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
<b>Rice. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Spain . . . . .	126	146	0	0	833	1,252	0	0	—	—
Italy . . . . .	417	545	4	2	3,111	4,716	53	134	—	—
United States . . . . .	198	417	37	29	2,771	2,615	328	203	—	—
Brazil . . . . .	—	—	—	—	(2) 1,936 (2)	831	—	—	—	—
India . . . . .	3,554	2,203	22	64	48,575	58,238	602	141	—	—
Indo-China . . . . .	1,854	1,210	—	—	21,017	21,998	—	—	—	—
Siam . . . . .	2,350	1,664	—	—	24,758	20,508	—	—	—	—
Egypt . . . . .	—	—	—	—	(2) 644 (2)	988 (2)	747 (2)	247	—	—
<i>Importing Countries:</i>										
Germany . . . . .	93	110	708	236	1,373	1,594	8,962	5,465	—	—
Austria . . . . .	0	0	130	57	0	0	756	606	—	—
Belgium . . . . .	15	0	106	97	190	9	1,349	1,047	—	—
Denmark . . . . .	0	0	20	13	0	0	157	139	—	—
Estonia . . . . .	—	—	2	2	—	—	23	35	—	—
Irish Free State . . . . .	—	—	—	—	(2) 0 (2)	0 (2)	49 (2)	42	—	—
France . . . . .	55	137	637	463	937	1,903	6,792	5,650	—	—
Gr. Brit. and N. Ir. . . . .	15	13	207	227	271	218	2,690	2,562	—	—
Greece . . . . .	—	—	49	62	—	—	540	536	—	—
Hungary . . . . .	0	2	31	57	2	9	481	388	—	—
Latvia . . . . .	0	0	9	7	0	7	82	62	—	—
Lithuania . . . . .	0	0	2	2	0	0	22	31	—	—
Norway . . . . .	—	—	2	4	—	—	117	101	—	—
Netherlands . . . . .	132	128	64	137	2,480	2,035	4,063	3,563	—	—
Poland . . . . .	64	11	35	0	606	126	1,726	1,177	—	—
Portugal . . . . .	—	—	53	35	—	—	613	941	—	—
Sweden . . . . .	—	—	0	0	—	—	123	161	—	—
Switzerland . . . . .	0	0	46	44	0	0	454	408	—	—
Czechoslovakia . . . . .	0	0	132	71	0	0	1,127	979	—	—
Yugoslavia . . . . .	0	0	60	93	4	2	511	516	—	—
Canada . . . . .	0	0	37	46	0	0	710	584	—	—
Chile . . . . .	—	—	20	44	—	—	402	518	—	—
Ceylon . . . . .	2	0	833	1,054	18	9	10,196	10,809	—	—
Java and Madura . . . . .	—	—	—	—	(2) 229 (2)	101 (2)	5,814 (2)	5,187	—	—
Japan . . . . .	26	307	251	20	4,195	1,257	2,773	3,973	—	—
Syria and Lebanon . . . . .	0	0	31	35	0	2	322	320	—	—
Turkey . . . . .	0	0	0	18	0	0	183	196	—	—
Algeria . . . . .	—	—	—	—	(2) 2 (2)	7 (2)	134 (2)	90	—	—
Tunis . . . . .	0	0	2	4	0	0	31	24	—	—
Union of S. Africa . . . . .	—	—	—	—	(3) 0 (3)	0 (3)	800 (3)	800	—	—
Australia . . . . .	22	4	2	4	161	71	29	75	—	—
New Zealand . . . . .	—	—	—	—	(2) 0 (2)	0 (2)	62 (2)	62	—	—
<b>Totals . . . . .</b>	<b>8,932</b>	<b>7,077</b>	<b>3,631</b>	<b>2,927</b>	<b>114,113</b>	<b>118,586</b>	<b>55,012</b>	<b>47,871</b>		
<b>Linseed. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Estonia . . . . .	0	4	0	0	4	55	0	2	—	—
Lithuania . . . . .	26	93	0	0	247	443	0	0	—	—
Argentina . . . . .	2,275	2,538	—	—	41,346	25,466	—	—	—	—
India . . . . .	238	97	0	0	2,515	5,855	0	0	—	—
Tunis . . . . .	0	0	0	0	4	9	0	0	—	—
<i>Importing Countries:</i>										
Germany . . . . .	2	0	547	229	13	26	7,507	5,194	—	—
Belgium . . . . .	22	2	231	267	205	68	3,702	1,676	—	—
Denmark . . . . .	—	—	20	42	—	—	417	359	—	—
Spain . . . . .	—	—	71	7	—	—	465	419	—	—
Finland . . . . .	0	0	7	7	0	0	68	79	—	—
France . . . . .	2	2	485	225	18	15	5,814	4,288	—	—
Gr. Brit. and N. Irel. . . . .	0	0	511	679	4	9	7,599	5,002	—	—
Greece . . . . .	0	0	4	2	0	2	95	64	—	—
Hungary . . . . .	0	2	0	0	42	143	2	106	—	—
Italy . . . . .	0	0	97	146	0	0	1,351	1,175	—	—
Latvia . . . . .	18	93	4	42	106	236	90	170	—	—
Norway . . . . .	—	—	33	51	—	—	289	357	—	—
Netherlands . . . . .	0	4	542	254	49	146	9,253	5,617	—	—
Poland . . . . .	0	0	2	4	7	31	273	150	—	—
Sweden . . . . .	—	—	46	35	—	—	1,056	798	—	—
Czechoslovakia . . . . .	2	2	51	26	7	18	582	445	—	—
Yugoslavia . . . . .	0	0	0	0	0	2	126	121	—	—
Canada . . . . .	104	282	0	0	584	738	194	454	—	—
United States . . . . .	—	—	110	123	—	—	8,109	7,090	—	—
Japan . . . . .	—	—	13	9	—	—	135	126	—	—
Australia . . . . .	0	0	2	9	0	0	291	340	—	—
<b>Totals . . . . .</b>	<b>2,689</b>	<b>3,119</b>	<b>2,790</b>	<b>2,157</b>	<b>45,151</b>	<b>33,307</b>	<b>47,468</b>	<b>34,032</b>		

(2) (3) See notes page 141.

COUNTRIES	DECEMBER				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
<b>Butter. — (Thousand lbs.)</b>										
<i>Exporting Countries:</i>										
Austria . . . . .	209	170	4	26	2,862	4,112	1,565	545	—	—
Denmark . . . . .	30,146	28,682	123	51	378,429	372,558	1,596	1,389	—	—
Estonia . . . . .	1,270	1,618	0	0	31,844	31,010	0	0	—	—
Irish Free State . . . . .	—	—	—	—	(2) 41,817 (2)	58,081 (2)	3,209 (2)	3,389	—	—
Finland . . . . .	2,815	2,800	0	0	38,367	37,726	0	7	—	—
France . . . . .	915	933	71	2,185	11,036	12,106	40,836	12,921	—	—
Hungary . . . . .	478	258	0	0	4,065	3,430	117	40	—	—
Latvia . . . . .	1,847	2,211	0	2	41,313	40,631	24	49	—	—
Lithuania . . . . .	567	725	0	0	19,191	16,219	0	0	—	—
Netherlands . . . . .	4,076	4,844	1,944	787	72,600	92,894	8,887	4,396	—	—
Poland . . . . .	540	1,005	0	4	27,470	26,114	31	29	—	—
Sweden . . . . .	2,515	3,922	7	0	43,162	58,557	40	18	—	—
U. S. S. R. . . . .	—	—	—	—	(4) 18,052 (4)	7,677	—	—	—	—
Argentina . . . . .	8,206	7,297	—	—	47,948	51,156	—	—	—	—
India . . . . .	44	60	29	22	364	551	344	282	—	—
Syria and Lebanon . . . . .	93	245	42	2	1,817	2,161	344	172	—	—
Australia . . . . .	24,527	18,345	0	0	208,924	126,411	0	2	—	—
New Zealand . . . . .	31,431	19,738	—	—	221,083	208,170	—	—	—	—
<i>Importing Countries:</i>										
Germany . . . . .	4	22	20,382	21,330	269	575	220,950	293,560	—	—
Belgium . . . . .	86	223	4,550	3,331	2,756	2,648	41,562	22,633	—	—
Spain . . . . .	2	2	42	4	88	161	121	328	—	—
Gr. Brit. and N. Irel. . . . .	8,649	4,707	8,788	73,544	40,228	20,514	903,907	764,019	—	—
Greece . . . . .	—	—	229	163	—	2,059	—	1,420	—	—
Italy . . . . .	18	95	767	518	1,290	1,843	6,188	3,115	—	—
Norway . . . . .	115	7	42	53	1,629	236	379	1,530	—	—
Switzerland . . . . .	2	2	2,604	2,251	20	40	23,358	18,794	—	—
Czechoslovakia . . . . .	37	15	154	2	601	694	4,107	714	—	—
Canada . . . . .	284	93	2	406	10,681	1,179	2,822	38,005	—	—
United States . . . . .	123	190	205	97	2,004	2,967	1,883	2,471	—	—
Ceylon . . . . .	—	—	55	76	—	—	642	723	—	—
Java and Madura . . . . .	—	—	—	—	—	—	(2) 7,862 (2)	7,158	—	—
Japan . . . . .	—	—	26	58	—	—	231	611	—	—
Algeria . . . . .	—	—	—	—	(2) 66 (2)	73 (2)	4,237 (2)	3,040	—	—
Egypt . . . . .	—	—	—	—	(2) 44 (2)	42 (2)	1,918 (2)	2,156	—	—
Tunis . . . . .	0	2	132	86	9	13	930	829	—	—
<b>Totals . . . . .</b>	<b>119,013</b>	<b>98,314</b>	<b>119,198</b>	<b>104,992</b>	<b>1,270,149</b>	<b>1,180,949</b>	<b>1,230,269</b>	<b>1,184,945</b>		
<b>Cheese. — (Thousand lbs.)</b>										
<i>Exporting Countries:</i>										
Denmark . . . . .	714	679	42	101	9,423	12,626	604	809	—	—
Finland . . . . .	353	260	11	7	5,776	4,083	83	35	—	—
Italy . . . . .	7,216	7,161	527	734	89,045	80,976	10,115	12,562	—	—
Lithuania . . . . .	205	165	0	2	2,546	1,960	11	11	—	—
Norway . . . . .	238	134	49	95	2,340	1,380	562	750	—	—
Netherlands . . . . .	12,278	13,997	130	132	190,480	206,739	1,345	1,510	—	—
Poland . . . . .	108	258	46	82	2,884	3,267	761	1,974	—	—
Switzerland . . . . .	2,321	4,647	1,149	375	54,307	66,143	8,470	4,287	—	—
Czechoslovakia . . . . .	1,310	1,036	247	106	10,981	8,274	3,779	2,968	—	—
Yugoslavia . . . . .	234	324	15	18	4,198	4,583	243	300	—	—
Canada . . . . .	3,896	4,026	159	121	84,790	66,955	1,446	1,779	—	—
Australia . . . . .	1,587	1,448	2	2	7,405	7,273	24	150	—	—
New Zealand . . . . .	21,940	28,025	0	0	181,391	201,256	4	4	—	—
<i>Importing Countries:</i>										
Germany . . . . .	573	505	8,353	8,376	7,372	5,410	120,404	137,459	—	—
Austria . . . . .	377	408	359	315	6,213	4,480	5,092	5,637	—	—
Belgium . . . . .	57	53	3,417	3,723	314	375	49,600	51,106	—	—
Spain . . . . .	7	18	441	679	236	207	3,867	5,836	—	—
Irish Free State . . . . .	—	—	—	—	(2) 154 (2)	170 (2)	2,421 (2)	2,107	—	—
France . . . . .	2,945	3,117	5,697	6,548	33,259	38,921	82,810	65,519	—	—
Gr. Brit. and N. Irel. . . . .	686	653	23,043	38,700	7,346	8,931	323,091	343,578	—	—
Greece . . . . .	24	31	522	86	190	302	3,960	2,302	—	—
Hungary . . . . .	7	9	9	20	110	93	203	386	—	—
Portugal . . . . .	—	—	141	220	—	—	842	1,010	—	—
Sweden . . . . .	—	—	179	205	—	—	1,691	1,470	—	—
United States . . . . .	212	181	5,194	5,236	1,865	2,127	61,992	68,313	—	—
India . . . . .	0	2	106	106	7	7	886	1,133	—	—
Java and Madura . . . . .	—	—	—	—	—	—	(2) 1,497 (2)	1,526	—	—
Syria and Lebanon . . . . .	0	4	46	148	86	132	708	730	—	—
Algeria . . . . .	—	—	—	—	(2) 157 (2)	196 (2)	10,446 (2)	9,310	—	—
Egypt . . . . .	—	—	—	—	(2) 57 (2)	60 (2)	6,768 (2)	6,828	—	—
Tunis . . . . .	0	2	317	165	24	29	2,033	1,746	—	—
<b>Totals . . . . .</b>	<b>57,288</b>	<b>67,143</b>	<b>55,901</b>	<b>66,907</b>	<b>704,436</b>	<b>738,955</b>	<b>706,468</b>	<b>737,240</b>		

(2) (4) See notes page 141.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<b>Cotton. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
United States . . .	6,318	4,156	24	22	21,621	21,253	132	95	36,391	538
Argentina . . .	15	7	—	—	249	216	—	—	511	—
Brazil . . .	—	—	—	—	(2) 161	(2) 163	—	—	516	—
India . . .	765	1,420	65	128	3,280	5,382	309	370	14,881	1,876
Egypt . . .	—	—	—	—	(2) 2,487	(2) 1,892	(2) 0	(2) 0	6,669	0
<i>Importing Countries:</i>										
Germany . . .	103	165	1,138	780	757	798	3,228	4,054	1,708	8,442
Austria . . .	0	0	77	42	0	0	243	205	0	467
Belgium . . .	26	7	181	137	165	53	683	655	201	1,713
Denmark . . .	—	—	20	11	—	—	57	60	—	154
Spain . . .	2	2	150	119	7	9	655	763	24	2,253
Estonia . . .	0	0	7	9	0	0	29	40	0	84
Finland . . .	0	0	18	22	0	0	73	84	0	172
France . . .	40	37	397	1,149	265	245	1,263	3,931	549	8,142
Gr. Brit. and N. Irel.	51	22	2,006	1,914	163	231	5,344	5,408	481	10,959
Greece . . .	0	0	22	22	0	0	93	88	0	225
Hungary . . .	—	—	46	29	—	—	137	126	—	251
Italy . . .	0	0	386	366	0	2	1,307	1,429	0	3,821
Latvia . . .	0	0	7	4	0	0	33	37	2	62
Norway . . .	—	—	7	7	—	—	18	22	—	46
Netherlands . . .	0	0	99	108	4	2	417	397	7	1,043
Poland . . .	2	2	90	101	11	9	485	708	24	1,444
Portugal . . .	—	—	44	60	—	—	157	163	—	383
Sweden . . .	—	—	66	49	—	—	265	212	—	467
Switzerland . . .	0	0	75	88	4	0	223	289	7	608
Czechoslovakia . . .	13	13	267	238	64	75	989	1,085	154	2,368
Yugoslavia . . .	0	0	22	20	0	0	86	82	0	185
Canada . . .	—	—	128	126	—	—	456	507	—	1,025
Japan . . .	42	42	1,698	1,105	340	245	4,253	4,173	534	13,741
Algeria . . .	—	—	—	—	(2) —	(2) —	(2) —	(2) —	24	4
<b>Totals . . .</b>	<b>7,437</b>	<b>5,882</b>	<b>7,038</b>	<b>6,656</b>	<b>29,608</b>	<b>30,577</b>	<b>20,947</b>	<b>24,933</b>	<b>62,681</b>	<b>60,463</b>

**Wool. — (Thousand lbs).**

COUNTRIES	FOUR MONTHS (September 1-December 31)				Twelve months (Sept. 1-August 31)			
	1931	1930	1931	1930	1931	1930	1931	1930
<i>Exporting Countries:</i>								
Spain . . .	377	251	306	410	1,023	2,414	935	1,325
Irish Free State . . .	—	—	—	—	(2) 3,977	(2) 1,640	(2) 218	(2) 165
Hungary . . .	20	108	117	227	1,118	1,133	556	562
Argentina . . . (a)	20,533	33,495	—	—	62,548	62,947	—	—
Chile . . . (b)	1,466	234	—	—	—	1,162	—	—
India . . .	6,089	2,800	291	55	15,454	10,805	1,338	439
Syria and Lebanon . . .	207	966	37	49	1,854	3,786	366	1,607
Algeria . . .	—	—	—	—	(2) 1,042	(2) 8,054	(2) 403	(2) 273
Egypt . . . (a)	—	—	—	—	(2) 549	(2) 717	(2) 0	(2) 0
Un. of S. Africa . . . (b)	—	—	—	—	(3) 11,603	(3) 28,153	(3) 0	(3) 0
Australia . . . (a)	114,700	113,164	33	66	(3) 472	(3) 622	(3) 430	(3) 77
New Zealand . . . (b)	5,293	3,400	0	0	375,728	364,811	73	265
— (a)	9,767	12,619	0	0	23,900	15,084	0	37
— (b)	3,572	734	0	0	13,175	20,044	2	0
— (c)	—	—	—	—	11,034	7,307	2	0
<i>Importing Countries:</i>								
Germany . . . (a)	2,240	701	15,296	25,122	6,854	2,978	37,900	73,610
Austria . . . (b)	966	802	2,831	2,425	4,550	4,023	9,936	9,694
Belgium . . . (a)	11	99	1,124	1,883	40	132	3,058	4,343
Denmark . . . (b)	324	836	10,655	13,820	4,484	4,405	26,416	31,830
Finland . . .	1,728	1,605	168	439	8,278	7,282	1,188	1,398
France . . .	26	4	584	340	57	13	1,717	1,268
Greece . . .	66	2	130	179	71	20	739	796
Italy . . . (a)	4,359	5,514	34,970	33,325	20,137	16,324	77,737	109,888
Gr. Britain and N. Ir.	23,016	20,607	95,346	75,182	69,730	79,038	204,073	170,206
Norway . . . (b)	2	15	813	260	57	148	853	977
Netherlands . . . (a)	282	53	7,657	14,498	597	661	23,232	26,705
Poland . . . (b)	110	37	1,334	653	794	833	5,948	3,605
Sweden . . .	108	40	194	152	293	291	778	540
Switzerland . . . (a)	205	130	516	741	811	597	1,731	1,964
Yugoslavia . . . (b)	20	15	558	637	163	97	2,427	1,980
Canada . . .	174	165	2,789	1,896	930	575	6,479	8,124
United States . . .	—	—	1,587	1,105	—	—	5,115	4,065
Japan . . .	35	0	2,174	2,390	284	7	5,093	5,613
Tunis . . .	278	98	3,878	2,207	1,132	494	11,986	9,575
— (a)	22	0	82	291	71	22	822	1,971
— (b)	370	42	430	704	3,298	800	1,559	2,466
— (c)	88	99	10,536	10,920	366	588	42,633	37,378
— (d)	20	0	25,767	12,873	33	2	41,463	30,269
— (e)	2	2	26	57	42	64	212	384
<b>Totals . . .</b>	<b>265,534</b>	<b>198,973</b>	<b>220,719</b>	<b>202,476</b>	<b>649,159</b>	<b>650,828</b>	<b>517,990</b>	<b>543,489</b>

a) — Wool, greasy; b) — Wool, scoured.

(c) (d) See notes page 141.

COUNTRIES	DECEMBER		SIX MONTHS (July 1-Dec. 31)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	DECEMBER		SIX MONTHS (July 1-Dec. 31)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1931	1930	1930-31		1931	1930	1931	1930	1930-31
<b>Coffee. (Thousand lbs.)</b>						<b>Tea. (Thousand lbs.)</b>					
<b>EXPORTS.</b>						<b>EXPORTS.</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Brazil . . . . .	...	...	(2) 896,447	(2) 843,818	2,317,260	Ceylon . . . . .	21,727	18,007	107,826	110,741	247,387
India . . . . .	112	639	2,866	5,240	23,490	India . . . . .	46,870	38,621	259,013	266,072	347,401
Java and Madura .	...	...	(2) 23,087	(2) 22,825	38,105	Java and Madura .	...	...	(2) 64,946	(2) 56,776	158,936
<i>Importing Countries:</i>						Japan . . . . .	3,459	1,455	16,228	15,135	24,315
Germany . . . . .	159	203	1,213	448	1,345	<i>Importing Countries:</i>					
Belgium . . . . .	1,140	220	6,012	8,697	5,090	Belgium . . . . .	2	4	13	20	31
France . . . . .	0	0	7	55	60	Irish Free State .	...	...	(2) 97	(2) 73	185
Netherlands . . . .	988	1,614	5,941	9,645	18,243	France . . . . .	2	2	44	20	35
Portugal . . . . .	121	40	505	917	553	Gr. Brit. and N. Ir.	6,956	5,858	47,351	44,348	87,052
Switzerland . . . .	51	35	333	148	399	Netherlands . . . .	11	18	66	57	115
Canada . . . . .	42	7	24	35	55	United States . . .	60	42	214	278	436
United States . . . .	1,424	2,114	7,906	12,785	24,238	Syria and Lebanon .	0	2	4	11	18
Ceylon . . . . .	2	0	7	223	237	Algeria . . . . .	...	...	(2) 26	(2) 7	22
Syria and Lebanon .	0	22	4	37	62	Union of S. Africa .	...	...	(3) 20	(3) 31	66
Australia . . . . .	15	0	33	26	53	Australia . . . . .	29	49	342	529	851
<b>Totals . . . . .</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,429,235</b>	New Zealand . . . .	...	...	(2) 31	(2) 55	116
<i>Importing Countries:</i>						<b>Totals . . . . .</b>	<b>79,116</b>	<b>64,958</b>	<b>496,221</b>	<b>495,053</b>	<b>867,915</b>
<b>IMPORTS.</b>						<b>IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	29,793	19,546	159,443	164,490	350,382	Germany . . . . .	900	731	5,269	6,338	12,741
Austria . . . . .	1,664	1,715	8,177	10,334	23,268	Austria . . . . .	123	137	622	688	1,400
Belgium . . . . .	10,558	10,073	64,130	52,606	123,457	Belgium . . . . .	40	49	201	309	639
Bulgaria . . . . .	154	152	635	794	1,600	Denmark . . . . .	99	73	631	569	1,206
Denmark . . . . .	5,763	4,751	31,664	28,845	63,224	Spain . . . . .	26	37	146	172	282
Spain . . . . .	5,152	4,182	23,664	43,577	68,795	Estonia . . . . .	13	11	68	77	146
Estonia . . . . .	24	33	126	183	309	Irish Free State .	...	...	(2) 11,570	(2) 10,781	24,340
Irish Free State . .	...	...	(2) 181	(2) 159	525	Finland . . . . .	13	18	161	182	260
Finland . . . . .	2,105	6,660	19,008	28,407	40,442	France . . . . .	311	324	1,631	1,631	3,536
France . . . . .	31,769	30,088	216,576	196,373	406,168	Gr. Britain and N.					
Gr. Britain and N.						Ireland . . . . .	66,540	67,920	326,409	332,377	541,616
Ireland . . . . .	2,712	2,635	18,186	18,071	37,858	Greece . . . . .	62	57	377	417	844
Greece . . . . .	1,768	1,082	7,899	6,400	12,050	Hungary . . . . .	66	58	397	408	850
Hungary . . . . .	551	584	3,292	3,657	7,568	Italy . . . . .	44	46	170	163	326
Italy . . . . .	8,029	7,882	40,348	48,149	98,430	Latvia . . . . .	13	15	71	90	168
Latvia . . . . .	44	81	212	109	351	Lithuania . . . . .	0	13	71	90	179
Lithuania . . . . .	33	53	203	265	478	Norway . . . . .	87	31	203	192	388
Norway . . . . .	3,640	2,571	20,309	17,500	37,690	Netherlands . . . .	2,390	2,352	14,980	14,701	32,512
Netherlands . . . .	8,973	9,094	54,772	51,875	100,483	Poland . . . . .	425	445	2,187	2,326	4,614
Poland . . . . .	2,026	1,495	9,290	8,893	17,589	Portugal . . . . .	60	73	335	320	597
Portugal . . . . .	1,717	1,248	5,915	5,022	11,413	Sweden . . . . .	86	71	487	434	928
Sweden . . . . .	11,217	7,524	66,902	49,593	100,829	Switzerland . . . .	150	115	908	836	1,731
Switzerland . . . .	3,472	2,438	16,290	13,757	31,608	Czechoslovakia . .	101	130	1,199	866	1,473
Czechoslovakia . .	1,753	1,836	17,229	12,954	29,026	Yugoslavia . . . .	55	80	441	450	628
Yugoslavia . . . . .	1,805	1,938	9,156	10,346	20,862	Canada . . . . .	3,014	3,327	14,240	24,273	43,147
Canada . . . . .	3,014	2,756	14,083	14,824	33,689	United States . . .	7,747	8,029	48,064	40,370	87,151
United States . . . .	158,835	144,913	708,840	755,904	1,728,578	Chile . . . . .	214	214	2,826	2,568	5,362
Chile . . . . .	768	659	5,313	4,758	10,516	Syria and Lebanon .	123	62	337	214	351
Ceylon . . . . .	377	119	2,043	1,559	3,148	Turkey . . . . .	163	243	948	1,118	2,138
Japan . . . . .	485	384	2,557	2,004	4,478	Algeria . . . . .	...	...	(2) 1,127	(2) 1,076	3,150
Syria and Lebanon .	298	335	1,240	1,444	2,732	Egypt . . . . .	...	...	(2) 6,587	(2) 4,586	13,616
Turkey . . . . .	875	1,561	5,238	6,268	12,853	Tunis . . . . .	251	289	5,280	1,554	2,952
Algeria . . . . .	...	...	(2) 11,973	(2) 12,165	30,827	Union of S. Africa .	...	...	(3) 5,393	(3) 4,321	13,298
Egypt . . . . .	...	...	(2) 9,204	(2) 4,941	14,548	Australia . . . . .	4,418	4,800	23,153	26,561	46,441
Tunis . . . . .	322	254	1,706	1,660	3,038	New Zealand . . . .	...	...	(2) 4,885	(2) 4,901	14,405
Un. of S. Africa . .	...	...	(3) 11,845	(3) 9,908	31,890	<i>Exporting Countries:</i>					
Australia . . . . .	150	71	1,592	1,301	2,619	India . . . . .	549	584	4,676	3,428	6,232
New Zealand . . . .	...	...	(2) 209	(2) 192	430	Java and Madura .	...	...	(2) 5,287	(2) 5,893	11,880
<b>Totals . . . . .</b>	<b>299,341</b>	<b>269,413</b>	<b>1,632,816</b>	<b>1,592,726</b>	<b>3,477,913</b>	<b>Totals . . . . .</b>	<b>88,123</b>	<b>90,402</b>	<b>492,244</b>	<b>504,320</b>	<b>881,182</b>

(2) (3) See notes page 141.

COUNTRIES	DECEMBER		THREE MONTHS (Oct. 1-Dec. 31)		TWELVE MONTHS (Oct. 1- Sept. 30)	COUNTRIES	DECEMBER		FIVE MONTHS (August 1-Dec. 31)		TWELVE MONTHS August 1- July 31
	1931	1930	1931	1930	1930-31		1931	1930	1931	1930	1930-31
<b>Cacao (Thousand lbs.).</b>						<b>Total Wheat and Flour (*)</b> (Thousand centals).					
<b>EXPORTS.</b>						<b>a) NET EXPORTS</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada . . . . .	...	(3)	179 (3)	254	9,089	Bulgaria . . . . .	392	42	3,360	922	3,527
Dominican Republ. . . . .	1,512	4,028	3,461	7,710	61,337	Spain . . . . .	7	11	(5)	33	104
Brazil . . . . .	...	(2)	35,980 (2)	25,843	146,469	Hungary . . . . .	1,358	1,299	8,051	7,004	10,591
Ecuador . . . . .	...	(3)	1,283 (3)	1,885	32,260	Lithuania . . . . .	7	128	20	212	597
Trinidad . . . . .	9 255	4,705	13,241	9,207	61,569	Poland . . . . .	(5)	287	392	1,383	2,586
Venezuela . . . . .	...	(3)	1,197 (3)	2,216	42,384	Rumania . . . . .	(7)	842 (7)	492 (7)	18,594 (7)	6,266
Ceylon . . . . .	1,528	1,089	2,851	2,584	8,360	U. S. S. R. . . . .	...	(7)	22,919 (7)	14,617 (7)	67,785
Java and Madura . . . . .	...	(2)	545 (2)	679	3,073	Yugoslavia . . . . .	714	176	6,360	2,806	3,392
Cameroon . . . . .	...	...	...	...	22,340	Canada . . . . .	14,577	14,906	63,621	86,457	154,489
Ivory Coast . . . . .	...	...	...	...	45,248	United States . . . . .	6,592	3,159	34,416	35,891	65,495
Gold Coast . . . . .	80,396	30 600	135,172	80,473	486,815	Argentina . . . . .	4,501	2,732	18,814	11,345	73,553
Nigeria . . . . .	19,480	18,133	32,657	29,952	113,325	Chile . . . . .	2	33	11	509	567
St. Thomas and Prince Is. . . . .	2,884	2,659	8,501	5,523	27,011	British India . . . . .	123	53	196	1,078	(5)
Togoland . . . . .	...	...	...	...	13,448	Syria and Lebanon . . . . .	26	(5)	306	(5)	(5)
						Turkey . . . . .	64	22	258	163	282
						Algeria . . . . .	...	(2)	573 (2)	3,777	4,614
						Tunis . . . . .	84	49	1,404	1,239	3,481
						Australia . . . . .	5,542	5,395	24,901	10,414	90,379
<b>Totals . . . . .</b>	<b>116,496</b>	<b>63,743</b>	<b>241,125</b>	<b>181,534</b>	<b>1,094,328</b>	<b>Totals . . . . .</b>	<b>34,891</b>	<b>28,784</b>	<b>204,202</b>	<b>193,118</b>	<b>490,889</b>
<b>IMPORTS</b>						<b>b) NET IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	238	432	238	432	454	Germany . . . . .	637	602	1,005	8,217	18,689
Belgium . . . . .	95	0	229	86	809	Austria . . . . .	1,111	904	3,697	3,927	9,345
France . . . . .	2	0	2	73	223	Belgium . . . . .	2,520	2,418	12,461	13,223	28,024
Netherlands . . . . .	604	1,202	3,422	3,320	10,679	Denmark . . . . .	1,043	624	6,274	2,628	6,905
Czechoslovakia . . . . .	0	0	0	13	18	Spain . . . . .	(6)	(6)	18	(6)	(6)
United States . . . . .	392	884	1,969	2,165	8,521	Estonia . . . . .	20	13	139	317	485
Australia . . . . .	20	11	108	20	66	Irish Free State . . . . .	...	(2)	4,308 (2)	4,138	11,279
						Finland . . . . .	141	86	1,484	1,740	2,956
						France . . . . .	2,154	1,567	16,773	10,862	36,595
						Gr. Brit. and N. Ir. . . . .	9,301	16,462	72,633	64,695	134,811
						Greece . . . . .	1,080	994	5,957	5,637	14,454
						Italy . . . . .	390	3,589	2,121	20,078	48,822
						Latvia . . . . .	81	49	245	498	924
						Norway . . . . .	556	423	2,507	2,446	4,985
						Netherlands . . . . .	1,647	1,281	7,280	9,023	20,858
						Poland . . . . .	57	(6)	(6)	(6)	(6)
						Portugal . . . . .	71	46	580	203	1,897
						Sweden . . . . .	390	245	1,605	1,768	2,889
						Switzerland . . . . .	(7)	1,358 (7)	805 (7)	6,528 (7)	5,324 (7)
						Czechoslovakia . . . . .	1,080	2,346	7,284	7,692	10,802
						Ceylon . . . . .	71	55	258	289	597
						India . . . . .	(6)	(6)	(6)	(6)	3,062
						Indochina . . . . .	44	55	231	265	571
						Japan . . . . .	884	898	3,232	2,075	10,964
						Java and Madura . . . . .	...	(2)	564 (2)	450	1,367
						Syria and Lebanon . . . . .	(6)	49	(6)	42	101
						Egypt . . . . .	...	(2)	1,823 (2)	1,797	5,763
						Union of South Afr. . . . .	...	3	897 (3)	474	1,938
						New Zealand . . . . .	...	2	110 (2)	128	497
<b>Totals . . . . .</b>	<b>92,220</b>	<b>87,153</b>	<b>235,965</b>	<b>232,001</b>	<b>1,156,013</b>	<b>Totals . . . . .</b>	<b>25,186</b>	<b>33,447</b>	<b>159,519</b>	<b>167,752</b>	<b>399,874</b>

(\*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

(a) Excess of exports over imports. — (b) Excess of imports over exports.

(1) Data up to 30th September. — (2) Data up to 30th November. — (3) Data up to 31st October. — (4) Data up to 30th June.

(5) See Net Imports. — (6) See Net Exports. — (7) Wheat only.

## STOCKS

## STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS

IN GERMANY, ON JANUARY, 15.

PRODUCTS	% Stocks · total production				% Available saleable quantities: total production			
	Jan. 15, 1932	Dec. 15, 1931	Jan. 15, 1931	Jan. 15, 1930	Jan. 15, 1932	Dec. 15, 1931	Jan. 15, 1931	Jan. 15, 1930
Winter wheat . . . . .	31.4	37.5	33.5	33.5	24.4	30.0	26.2	31.9
Spring wheat . . . . .	58.4	66.8	61.1	65.7	47.8	54.7	47.1	51.8
Winter rye . . . . .	33.7	41.0	44.2	48.1	13.8	17.4	22.0	26.9
Winter barley . . . . .	20.4	26.7	21.6	34.1	3.2	4.2	2.4	7.5
Spring barley . . . . .	44.7	54.4	36.3	48.7	25.6	32.6	17.7	30.3
Oats . . . . .	69.0	69.0	64.0	64.1	13.9	16.5	17.0	24.0
Potatoes . . . . .	47.6	55.7	49.1	50.6	14.4	16.9	14.5	14.5

Authority: Preisberichtsstelle beim Deutschen Landwirtschaftsrai.

## COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930
	1,000 centals					1,000 bushels				
<b>WHEAT:</b>										
Canadian in Canada . . . .	104,156	103,579	101,463	105,445	110,900	173,593	172,631	169,088	175,741	184,834
U. S. in Canada . . . . .	17,191	17,152	17,648	2,881	4,510	28,652	28,586	29,414	4,802	7,517
U. S. in the United States . .	130,631	136,066	142,259	121,616	101,008	217,719	230,776	237,009	202,604	168,346
Canad. in the United States . .	13,143	15,127	14,087	16,274	21,310	21,945	25,212	25,479	27,124	35,517
Total . . . . .	265,121	271,924	275,447	246,216	237,728	441,889	453,205	459,080	410,261	396,214
<b>RYE:</b>										
Canadian in Canada . . . . .	6,250	6,425	6,838	7,364	4,675	11,161	11,473	12,202	13,150	8,348
U. S. in Canada . . . . .	478	422	438	1,211	1,523	853	754	782	2,167	2,720
U. S. in the United States . .	5,648	5,725	5,839	8,752	8,140	10,085	10,223	10,427	15,029	14,856
Canad. in the United States . .	954	978	787	250	242	1,703	1,746	1,405	446	431
Total . . . . .	13,330	13,550	13,897	17,540	14,580	23,802	24,196	24,816	31,392	26,035
<b>BARLEY:</b>										
Canadian in Canada . . . . .	4,741	4,786	4,624	13,998	12,475	9,878	9,970	9,633	29,163	25,080
U. S. in Canada . . . . .	12	12	12	148	450	25	25	24	309	937
U. S. in the United States . .	2,741	2,957	3,419	6,845	5,261	5,710	6,160	7,123	14,261	10,961
Canad. in the United States . .	762	762	812	612	1,443	1,587	1,687	640	1,274	3,006
Total . . . . .	8,256	8,517	8,867	21,603	19,629	17,200	17,742	17,429	45,007	40,893
<b>OATS: (1)</b>										
Canadian in Canada . . . . .	4,972	5,208	4,616	4,828	6,837	15,538	16,556	14,426	15,087	21,365
U. S. in Canada . . . . .	4	56	159	378	1,100	12	175	496	1,180	3,439
U. S. in the United States . .	5,471	5,370	5,812	8,566	8,351	17,096	16,782	18,164	20,770	20,097
Canad. in the United States . .	1	10	10	53	203	2	32	32	167	634
Total . . . . .	10,448	10,734	10,597	13,825	16,491	32,648	33,545	33,118	45,204	51,535
<b>MAIZE:</b>										
U. S. in Canada . . . . .	410	515	570	247	101	732	920	1,017	441	180
of other origin in Canada . .	1,122	1,177	1,280	573	920	2,003	2,102	2,288	1,023	1,643
U. S. in the United States . .	7,939	7,085	5,487	9,734	9,004	14,176	12,651	9,798	17,383	16,079
Total . . . . .	9,471	8,777	7,337	10,554	10,025	16,911	15,673	13,101	18,847	17,902

(1) All oats expressed in bushels of 32 lbs.

STOCKS OF POTATOES IN FARMERS' HANDS IN THE NETHERLANDS  
(partial data) (1).

DATE OF ESTIMATE	% Stocks production		Production in absolute figures				Production of communes as percentage of total production for the country (2).
	Clay soils	Sand and fen soils	Clay soils	Sand and fen soils	Clay soils	Sand and fen soils	
			1,000 centals		1,000 bushels		
15 January 1930 . . . . .	42	16	9,573	1,903	15,954	8,172	58
15 April 1930 . . . . .	16	6	3,624	1,836	6,041	3,061	
15 January 1931 . . . . .	27	16	4,561	4,226	7,602	7,044	65
15 April 1931 . . . . .	8	5	1,314	1,243	2,190	2,072	
15 January 1932 . . . . .	28	10	4,078	4,206	8,207	7,011	...

(1) Estimate for the communes in which production is considered to exceed consumption. — (2) Production of the year preceding that indicated.

QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

SPECIFICATION	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat) . .	30,413	17,890	21,432	22,361	22,579	50,688	20,816	35,720	37,272	37,632
Rye . . . . .	1,210	1,445	2,443	523	34	2,177	2,580	4,363	934	60
Barley . . . . .	3,084	1,800	3,652	4,000	2,744	6,425	3,760	7,008	8,333	5,717
Oats . . . . .	2,435	838	1,222	1,715	768	7,610	2,620	3,820	5,360	2,400
Maize . . . . .	14,501	22,262	25,162	10,022	10,142	25,894	30,754	44,931	29,083	18,111

Authority *Broomhall's Corn Trade News*.

GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930
	1000 centals					1000 bushels				
WHEAT:										
Grain . . . . .	9,792	13,320	16,608	9,504	8,266	16,320	22,200	27,680	15,840	13,776
Flour as grain . .	864	1,008	1,104	912	806	1,440	1,680	1,840	1,520	1,344
TOTAL . . .	10,656	14,328	17,712	10,416	9,072	17,760	23,880	29,520	17,360	15,120
Barley . . . . .	800	1,120	1,100	1,840	1,560	1,667	2,333	2,292	3,833	3,250
Oats . . . . .	448	448	432	1,312	672	1,400	1,400	1,350	4,100	2,100
Maize . . . . .	6,048	5,976	3,840	2,856	3,120	10,800	10,671	6,657	5,100	5,571

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.

STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930	Jan. 1932	Dec. 1931	Nov. 1931	Jan. 1931	Jan. 1930
	1000 centals					1000 bales (counting round as half bales)				
In consuming establishments . . . . .	7,833	7,799	8,895	7,728	8,857	1,637	1,680	1,441	1,614	1,880
In public storage and at compresses . .	48,003	48,888	51,180	37,988	26,182	10,032	10,426	10,696	7,939	5,407
TOTAL . . .	55,836	56,687	58,075	45,711	35,039	11,669	12,066	12,137	9,553	7,287

## STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1) . . . .	1,760	1,516	1,452	3,244	4,580	836	317	304	670	960
Alexandria . . . .	5,408	5,587	5,521	3,208	3,371	1,144	1,149	1,155	2,108	705

Authorities: *East Indian Cotton Ass.* and *Bourse de Minet-el-Bassal*.

(1) Stocks held by exporters, dealers and mills.

## STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930
	1000 centals					1000 bales (1 bale = 478 lbs.)				
<i>Great Britain:</i>										
American . . . .	2,111	2,032	1,459	2,879	2,631	442	425	305	602	404
Argentine, Brazil- ian, etc. . . . .	98	206	192	188	605	21	43	40	30	127
Peruvian, etc. . .	226	262	265	397	369	47	55	56	83	77
East Indian, etc.	575	635	527	322	207	120	133	110	68	43
Egyptian, Sudan- ese . . . . .	1,392	1,309	1,287	1,448	991	291	274	269	303	207
Other (1) . . . .	140	179	190	228	251	29	37	40	48	58
TOTAL . . . .	4,542	4,623	3,920	5,162	4,784	950	967	829	1,143	1,001
<i>Bremen:</i>										
American . . . .	1,601	1,729	1,366	2,712	2,555	335	361	286	568	535
Other . . . . .	23	18	35	73	39	5	4	7	15	8
TOTAL . . . .	1,624	1,747	1,401	2,785	2,594	340	365	293	583	543
<i>Le Havre:</i>										
American . . . .	752	863	821	1,027	1,312	157	181	172	340	275
Other . . . . .	109	117	119	169	117	23	24	25	36	24
TOTAL . . . .	861	980	940	1,196	1,429	180	205	197	376	299
<i>Total Continent (2):</i>										
American . . . .	3,266	3,621	2,703	4,936	4,484	683	682	565	1,033	938
Argentine, Brazil- ian, etc. . . . .	30	45	57	148	77	8	9	12	31	16
E. Indian, Australia, ian, etc. . . . .	108	95	115	210	117	23	20	24	44	24
Egyptian . . . .	157	142	126	145	115	33	30	26	30	24
W. Indian, W. African, E. African, etc. . . . .	28	32	36	82	94	6	7	8	17	20
TOTAL . . . .	3,598	3,575	3,077	5,321	4,887	753	748	635	1,155	1,022

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.



## THE FALL IN PRICES OF AGRICULTURAL COMMODITIES IN 1931

In the following article it is proposed, as in previous years, to give a general survey of the movement of prices of agricultural commodities in 1931. For this purpose there are published in a series of tables the prices of 28 commodities of world importance. There will be found in this series the average prices for January, April and each month of the latter half of 1931 as well as the averages for the whole of 1931 or of the last commercial season; these prices are compared with those of January, April, July and October of 1930 and of the two preceding years or seasons. The monthly averages have mostly been obtained by taking as basis the quotations for Friday of each week and the annual averages by taking as basis the monthly averages.

For the purpose of facilitating comparison, all the prices have been converted to dollars per cental or bushel on the basis of the parity between the currency of the country and the American dollar in all cases where exchange fluctuations were very small and on the basis of the monthly average rates of exchange in cases where the movement of the rate of exchange showed fluctuations of some importance during the period under consideration.

TABLE I. — *Wheat prices, in American cents per bushel (60 lbs.).*

PERIODS	Winnipeg: No 1 Manitoba	Chicago: No 2 Hard Winter	Buenos Aires: Barletta	Karachi: Karachi White	Liv. & London: No 3 Manitoba	Liv. & London: No 2 Hard Winter	Liv. & London: Rosafé	Liv. & London: Karachi White	Liv. & London: Australian	Berlin: Home grown	Antwerp: Home grown	Paris: Home grown	Milan: Home grown
Yearly average (1):													
1927-28 . . . . .	146 <sup>3</sup> / <sub>8</sub>	137 <sup>7</sup> / <sub>8</sub>	137 <sup>1</sup> / <sub>8</sub>	138 <sup>3</sup> / <sub>8</sub>	154 <sup>1</sup> / <sub>8</sub>	151 <sup>1</sup> / <sub>8</sub>	150 <sup>1</sup> / <sub>8</sub>	150 <sup>1</sup> / <sub>8</sub>	159 <sup>1</sup> / <sub>8</sub>	162 <sup>1</sup> / <sub>8</sub>	137 <sup>1</sup> / <sub>8</sub>	172 <sup>1</sup> / <sub>8</sub>	189
1928-29 . . . . .	124	119 <sup>1</sup> / <sub>8</sub>	118 <sup>3</sup> / <sub>8</sub>	146 <sup>3</sup> / <sub>8</sub>	138 <sup>3</sup> / <sub>8</sub>	131 <sup>1</sup> / <sub>8</sub>	128 <sup>1</sup> / <sub>8</sub>	n. q.	139 <sup>3</sup> / <sub>8</sub>	141 <sup>1</sup> / <sub>8</sub>	122 <sup>1</sup> / <sub>8</sub>	165 <sup>1</sup> / <sub>8</sub>	188 <sup>3</sup> / <sub>8</sub>
1929-30 . . . . .	124 <sup>3</sup> / <sub>8</sub>	114 <sup>3</sup> / <sub>8</sub>	114 <sup>3</sup> / <sub>8</sub>	121 <sup>1</sup> / <sub>8</sub>	137 <sup>3</sup> / <sub>8</sub>	126	122 <sup>3</sup> / <sub>8</sub>	128 <sup>3</sup> / <sub>8</sub>	132 <sup>3</sup> / <sub>8</sub>	164 <sup>1</sup> / <sub>8</sub>	117 <sup>1</sup> / <sub>8</sub>	148 <sup>3</sup> / <sub>8</sub>	188 <sup>3</sup> / <sub>8</sub>
1930-31 . . . . .	64 <sup>1</sup> / <sub>8</sub>	78	61 <sup>1</sup> / <sub>2</sub>	68 <sup>3</sup> / <sub>8</sub>	77	80 <sup>3</sup> / <sub>8</sub>	71 <sup>1</sup> / <sub>8</sub>	82 <sup>1</sup> / <sub>8</sub>	77 <sup>3</sup> / <sub>8</sub>	168 <sup>1</sup> / <sub>2</sub>	72 <sup>1</sup> / <sub>8</sub>	186 <sup>3</sup> / <sub>8</sub>	158 <sup>3</sup> / <sub>8</sub>
Monthly average:													
January 1930 . . . . .	129 <sup>1</sup> / <sub>8</sub>	122 <sup>1</sup> / <sub>8</sub>	123 <sup>1</sup> / <sub>8</sub>	133 <sup>1</sup> / <sub>8</sub>	146 <sup>3</sup> / <sub>8</sub>	137 <sup>1</sup> / <sub>8</sub>	138 <sup>3</sup> / <sub>8</sub>	n. q.	142 <sup>1</sup> / <sub>8</sub>	159 <sup>1</sup> / <sub>2</sub>	115 <sup>3</sup> / <sub>8</sub>	140 <sup>3</sup> / <sub>8</sub>	194 <sup>1</sup> / <sub>8</sub>
April . . . . .	110 <sup>1</sup> / <sub>8</sub>	108	113 <sup>1</sup> / <sub>8</sub>	110 <sup>3</sup> / <sub>8</sub>	125	120 <sup>3</sup> / <sub>8</sub>	116 <sup>3</sup> / <sub>8</sub>	124 <sup>1</sup> / <sub>2</sub>	123 <sup>1</sup> / <sub>2</sub>	174 <sup>1</sup> / <sub>8</sub>	111 <sup>3</sup> / <sub>8</sub>	141 <sup>1</sup> / <sub>8</sub>	194 <sup>1</sup> / <sub>2</sub>
July . . . . .	96	89	98	80 <sup>3</sup> / <sub>8</sub>	108 <sup>3</sup> / <sub>8</sub>	102 <sup>3</sup> / <sub>8</sub>	102 <sup>3</sup> / <sub>8</sub>	104 <sup>3</sup> / <sub>8</sub>	110 <sup>3</sup> / <sub>8</sub>	186 <sup>3</sup> / <sub>8</sub>	115 <sup>1</sup> / <sub>2</sub>	166 <sup>1</sup> / <sub>8</sub>	178
October . . . . .	73	79	76 <sup>1</sup> / <sub>8</sub>	71 <sup>1</sup> / <sub>8</sub>	80 <sup>3</sup> / <sub>8</sub>	86 <sup>1</sup> / <sub>8</sub>	81 <sup>3</sup> / <sub>8</sub>	87	88 <sup>3</sup> / <sub>8</sub>	147 <sup>3</sup> / <sub>8</sub>	66 <sup>1</sup> / <sub>8</sub>	130	170 <sup>3</sup> / <sub>8</sub>
January, 1931 . . . . .	53 <sup>3</sup> / <sub>8</sub>	70 <sup>1</sup> / <sub>8</sub>	52	67 <sup>3</sup> / <sub>8</sub>	70 <sup>1</sup> / <sub>8</sub>	n. q.	60 <sup>3</sup> / <sub>8</sub>	n. q.	69 <sup>3</sup> / <sub>8</sub>	107 <sup>3</sup> / <sub>8</sub>	62 <sup>1</sup> / <sub>2</sub>	184 <sup>1</sup> / <sub>8</sub>	149 <sup>1</sup> / <sub>8</sub>
April . . . . .	59	82 <sup>3</sup> / <sub>8</sub>	51 <sup>1</sup> / <sub>8</sub>	63 <sup>1</sup> / <sub>8</sub>	70 <sup>1</sup> / <sub>8</sub>	n. q.	63 <sup>3</sup> / <sub>8</sub>	n. q.	60 <sup>3</sup> / <sub>8</sub>	186 <sup>3</sup> / <sub>8</sub>	70 <sup>3</sup> / <sub>8</sub>	198 <sup>1</sup> / <sub>8</sub>	152 <sup>1</sup> / <sub>2</sub>
July . . . . .	57 <sup>3</sup> / <sub>8</sub>	52 <sup>3</sup> / <sub>8</sub>	49 <sup>3</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>8</sub>	64 <sup>3</sup> / <sub>8</sub>	62 <sup>3</sup> / <sub>8</sub>	57 <sup>1</sup> / <sub>2</sub>	65 <sup>3</sup> / <sub>8</sub>	65 <sup>3</sup> / <sub>8</sub>	156	75	180	130 <sup>1</sup> / <sub>8</sub>
August . . . . .	55 <sup>3</sup> / <sub>8</sub>	51	44 <sup>1</sup> / <sub>8</sub>	58 <sup>3</sup> / <sub>8</sub>	60	57 <sup>1</sup> / <sub>8</sub>	54 <sup>3</sup> / <sub>8</sub>	n. q.	59 <sup>3</sup> / <sub>8</sub>	136 <sup>3</sup> / <sub>8</sub>	73 <sup>1</sup> / <sub>8</sub>	173 <sup>1</sup> / <sub>8</sub>	126 <sup>3</sup> / <sub>8</sub>
September . . . . .	53	50 <sup>3</sup> / <sub>8</sub>	43	57 <sup>1</sup> / <sub>8</sub>	57 <sup>1</sup> / <sub>8</sub>	55 <sup>1</sup> / <sub>2</sub>	51 <sup>1</sup> / <sub>2</sub>	n. q.	58 <sup>1</sup> / <sub>8</sub>	139	69 <sup>1</sup> / <sub>2</sub>	177 <sup>3</sup> / <sub>8</sub>	135
October . . . . .	53 <sup>1</sup> / <sub>2</sub>	52 <sup>3</sup> / <sub>8</sub>	43 <sup>3</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>8</sub>	58 <sup>1</sup> / <sub>2</sub>	55 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>2</sub>	61 <sup>1</sup> / <sub>2</sub>	61 <sup>1</sup> / <sub>8</sub>	139 <sup>1</sup> / <sub>8</sub>	n. q.	173 <sup>1</sup> / <sub>8</sub>	135 <sup>3</sup> / <sub>8</sub>
November . . . . .	58 <sup>3</sup> / <sub>8</sub>	61 <sup>3</sup> / <sub>8</sub>	53	57 <sup>3</sup> / <sub>8</sub>	67 <sup>1</sup> / <sub>2</sub>	64 <sup>1</sup> / <sub>8</sub>	63 <sup>1</sup> / <sub>8</sub>	74 <sup>1</sup> / <sub>8</sub>	68 <sup>3</sup> / <sub>8</sub>	146 <sup>1</sup> / <sub>8</sub>	n. q.	172 <sup>3</sup> / <sub>8</sub>	141 <sup>1</sup> / <sub>8</sub>
December . . . . .	50	56	45 <sup>3</sup> / <sub>8</sub>	57 <sup>1</sup> / <sub>8</sub>	60 <sup>3</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>8</sub>	55 <sup>1</sup> / <sub>8</sub>	n. q.	61 <sup>3</sup> / <sub>8</sub>	138 <sup>3</sup> / <sub>8</sub>	58 <sup>3</sup> / <sub>8</sub>	174	144 <sup>3</sup> / <sub>8</sub>

(1) Commercial season: August-July.

In grouping the data for the same product on different markets, it must, of course, be borne in mind that the differences in prices are partly due to differences in the qualities to which the quotations refer.

No attempt has been made to enter into a detailed examination of the tables as this would be outside the scope of the present study, which is intended only to give a general view of the price situation of agricultural commodities and is limited to drawing some general conclusions from the data here assembled.

For this purpose it is necessary to select quotations on those markets where the prices

are not influenced by protective measures and which therefore reflect the situation of world supply and demand more faithfully than those quoted on markets the prices of which are affected by tariff duties or other measures.

TABLE II. — *Rye and Barley prices, in American cents per bushel.*

PERIODS	RYE (56 lbs.)						BARLEY (48 lbs.)						
	Budapest. Home grown	Warsaw. Home grown	Minneapolis No 2 Rye	Berlin. Home grown	Danemark. Imported	Groningen Home grown	Brussels. Home grown	Wj. impreg. No 4 Western	Chicago: Feeding	Berlin. Home grown	Liv. & London Danubian	Liv. & London: Californian Matting	
Yearly average (1)													
1927-28 . . . . .	...	124 <sup>3</sup> / <sub>8</sub>	106 <sup>1</sup> / <sub>2</sub>	151 <sup>1</sup> / <sub>4</sub>	142 <sup>1</sup> / <sub>4</sub>	118 <sup>1</sup> / <sub>2</sub>	82 <sup>3</sup> / <sub>8</sub>	82 <sup>1</sup> / <sub>4</sub>	86 <sup>1</sup> / <sub>4</sub>	111	105 <sup>5</sup> / <sub>8</sub>	135 <sup>5</sup> / <sub>8</sub>	
1928-29 . . . . .		98 <sup>3</sup> / <sub>2</sub>	99	123 <sup>7</sup> / <sub>8</sub>	124 <sup>7</sup> / <sub>8</sub>	99 <sup>1</sup> / <sub>2</sub>	71 <sup>1</sup> / <sub>4</sub>	67 <sup>3</sup> / <sub>8</sub>	56 <sup>7</sup> / <sub>8</sub>	102 <sup>3</sup> / <sub>8</sub>	94 <sup>7</sup> / <sub>8</sub>	108 <sup>3</sup> / <sub>8</sub>	
1929-30 . . . . .	59 <sup>1</sup> / <sub>4</sub>	62 <sup>7</sup> / <sub>8</sub>	80 <sup>3</sup> / <sub>8</sub>	103 <sup>7</sup> / <sub>8</sub>	80 <sup>1</sup> / <sub>2</sub>	64 <sup>3</sup> / <sub>8</sub>	39 <sup>3</sup> / <sub>8</sub>	51 <sup>7</sup> / <sub>8</sub>	57 <sup>3</sup> / <sub>8</sub>	90 <sup>3</sup> / <sub>4</sub>	66	84 <sup>1</sup> / <sub>4</sub>	
1930-31 . . . . .	47 <sup>3</sup> / <sub>8</sub>	62 <sup>1</sup> / <sub>4</sub>	42 <sup>3</sup> / <sub>8</sub>	104	57 <sup>3</sup> / <sub>8</sub>	45 <sup>3</sup> / <sub>8</sub>	30 <sup>1</sup> / <sub>4</sub>	20 <sup>1</sup> / <sub>4</sub>	43 <sup>3</sup> / <sub>8</sub>	101 <sup>1</sup> / <sub>4</sub>	44 <sup>1</sup> / <sub>4</sub>	72 <sup>3</sup> / <sub>8</sub>	
Monthly average:													
January, 1930 . . . . .	61 <sup>5</sup> / <sub>8</sub>	65 <sup>3</sup> / <sub>8</sub>	88 <sup>3</sup> / <sub>8</sub>	97 <sup>3</sup> / <sub>4</sub>	95 <sup>3</sup> / <sub>4</sub>	66	40 <sup>3</sup> / <sub>8</sub>	50 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>8</sub>	83 <sup>3</sup> / <sub>8</sub>	67 <sup>3</sup> / <sub>8</sub>	86	
April, " . . . . .	49 <sup>3</sup> / <sub>8</sub>	64 <sup>3</sup> / <sub>8</sub>	71 <sup>1</sup> / <sub>8</sub>	100 <sup>3</sup> / <sub>8</sub>	80 <sup>3</sup> / <sub>8</sub>	61	35 <sup>3</sup> / <sub>4</sub>	45	57 <sup>1</sup> / <sub>2</sub>	94 <sup>3</sup> / <sub>8</sub>	57 <sup>1</sup> / <sub>8</sub>	78 <sup>3</sup> / <sub>4</sub>	
July, " . . . . .	50	56 <sup>1</sup> / <sub>4</sub>	54	104	66 <sup>3</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>4</sub>	32	35 <sup>3</sup> / <sub>8</sub>	48	94 <sup>3</sup> / <sub>8</sub>	46	67 <sup>3</sup> / <sub>4</sub>	
October, " . . . . .	36 <sup>1</sup> / <sub>4</sub>	53 <sup>7</sup> / <sub>8</sub>	49 <sup>3</sup> / <sub>8</sub>	89 <sup>3</sup> / <sub>8</sub>	57 <sup>3</sup> / <sub>2</sub>	46 <sup>3</sup> / <sub>8</sub>	23 <sup>3</sup> / <sub>4</sub>	25 <sup>3</sup> / <sub>8</sub>	48 <sup>3</sup> / <sub>4</sub>	99 <sup>3</sup> / <sub>8</sub>	38 <sup>3</sup> / <sub>8</sub>	68 <sup>3</sup> / <sub>8</sub>	
January, 1931 . . . . .	42 <sup>3</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>8</sub>	38	94 <sup>3</sup> / <sub>4</sub>	54 <sup>3</sup> / <sub>8</sub>	44	26 <sup>3</sup> / <sub>8</sub>	19	42 <sup>3</sup> / <sub>8</sub>	89 <sup>3</sup> / <sub>8</sub>	n. q.	68 <sup>3</sup> / <sub>8</sub>	
April, " . . . . .	58 <sup>3</sup> / <sub>8</sub>	75 <sup>3</sup> / <sub>8</sub>	35	115 <sup>3</sup> / <sub>8</sub>	50 <sup>3</sup> / <sub>2</sub>	42 <sup>3</sup> / <sub>8</sub>	34	25 <sup>3</sup> / <sub>8</sub>	43 <sup>3</sup> / <sub>4</sub>	118 <sup>3</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>8</sub>	71 <sup>3</sup> / <sub>4</sub>	
July, " . . . . .	52 <sup>3</sup> / <sub>8</sub>	73 <sup>3</sup> / <sub>8</sub>	37 <sup>3</sup> / <sub>8</sub>	110 <sup>3</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>2</sub>	43 <sup>3</sup> / <sub>8</sub>	33 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>8</sub>	38 <sup>3</sup> / <sub>8</sub>	111 <sup>3</sup> / <sub>8</sub>	43 <sup>3</sup> / <sub>8</sub>	82 <sup>3</sup> / <sub>2</sub>	
August, " . . . . .	38 <sup>3</sup> / <sub>4</sub>	58 <sup>3</sup> / <sub>4</sub>	39 <sup>3</sup> / <sub>8</sub>	98 <sup>3</sup> / <sub>8</sub>	48 <sup>3</sup> / <sub>4</sub>	44 <sup>3</sup> / <sub>8</sub>	27 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>8</sub>	41 <sup>3</sup> / <sub>4</sub>	80 <sup>3</sup> / <sub>4</sub>	42 <sup>3</sup> / <sub>8</sub>	70 <sup>3</sup> / <sub>8</sub>	
September, " . . . . .	39 <sup>3</sup> / <sub>8</sub>	61	39 <sup>3</sup> / <sub>8</sub>	109 <sup>3</sup> / <sub>8</sub>	48 <sup>3</sup> / <sub>8</sub>	47	24 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>8</sub>	44	80	38 <sup>3</sup> / <sub>8</sub>	78 <sup>3</sup> / <sub>4</sub>	
October, " . . . . .	43 <sup>3</sup> / <sub>8</sub>	64 <sup>3</sup> / <sub>8</sub>	41 <sup>3</sup> / <sub>2</sub>	113 <sup>3</sup> / <sub>8</sub>	51 <sup>1</sup> / <sub>2</sub>	45	28 <sup>3</sup> / <sub>2</sub>	28	47 <sup>3</sup> / <sub>8</sub>	81 <sup>3</sup> / <sub>8</sub>	n. q.	72 <sup>3</sup> / <sub>4</sub>	
November, " . . . . .	54	75	50 <sup>3</sup> / <sub>8</sub>	119 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>2</sub>	53 <sup>3</sup> / <sub>2</sub>	37 <sup>3</sup> / <sub>8</sub>	35 <sup>3</sup> / <sub>8</sub>	44 <sup>3</sup> / <sub>8</sub>	86 <sup>3</sup> / <sub>8</sub>	51 <sup>3</sup> / <sub>8</sub>	78 <sup>3</sup> / <sub>4</sub>	
December, " . . . . .	63 <sup>3</sup> / <sub>8</sub>	77 <sup>3</sup> / <sub>8</sub>	40 <sup>3</sup> / <sub>4</sub>	115	57	47 <sup>3</sup> / <sub>2</sub>	30 <sup>3</sup> / <sub>4</sub>	29 <sup>3</sup> / <sub>4</sub>	15 <sup>3</sup> / <sub>4</sub>	78 <sup>3</sup> / <sub>8</sub>	n. q.	75 <sup>3</sup> / <sub>2</sub>	

(1) Commercial season: August-July.

TABLE III. — *Oats and Maize prices, in American cents per bushel.*

PERIODS	OATS (32 lbs) (1)						MAIZE (56 lbs) (2)					
	Braila : Home grown	Winnipeg N. 2 White Western	Chicago : N. 2 White	Buenos Aires : La Plata	Berlin : Home grown	Paris : Home grown	Braila Danube	Chicago : N. 2 Mixed	Buenos Aires : Yellow Plate	Liv. & London : N. 2 White African	Milan . Home grown	Rottendam : Yellow Plate
Yearly average:												
1927-28 . . . . .	52 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>8</sub>	58 <sup>3</sup> / <sub>8</sub>	54 <sup>1</sup> / <sub>2</sub>	78 <sup>3</sup> / <sub>8</sub>	71 <sup>1</sup> / <sub>8</sub>	106 <sup>3</sup> / <sub>8</sub>	97 <sup>3</sup> / <sub>8</sub>	89 <sup>3</sup> / <sub>4</sub>	106 <sup>3</sup> / <sub>8</sub>	138 <sup>3</sup> / <sub>2</sub>	112 <sup>7</sup> / <sub>8</sub>
1928-29 . . . . .	48 <sup>3</sup> / <sub>4</sub>	55 <sup>3</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>4</sub>	47 <sup>7</sup> / <sub>8</sub>	69 <sup>1</sup> / <sub>8</sub>	72 <sup>3</sup> / <sub>4</sub>	104 <sup>3</sup> / <sub>8</sub>	94 <sup>3</sup> / <sub>8</sub>	80 <sup>3</sup> / <sub>4</sub>	109 <sup>3</sup> / <sub>4</sub>	130 <sup>3</sup> / <sub>8</sub>	108 <sup>3</sup> / <sub>8</sub>
1929-30 . . . . .	22 <sup>3</sup> / <sub>4</sub>	55	44 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>2</sub>	54	46 <sup>3</sup> / <sub>8</sub>	46 <sup>3</sup> / <sub>8</sub>	35 <sup>3</sup> / <sub>8</sub>	62	73 <sup>3</sup> / <sub>8</sub>	95 <sup>3</sup> / <sub>8</sub>	76 <sup>3</sup> / <sub>4</sub>
1930-31 . . . . .	21 <sup>1</sup> / <sub>2</sub>	28 <sup>1</sup> / <sub>4</sub>	32 <sup>3</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>4</sub>	55 <sup>3</sup> / <sub>8</sub>	46 <sup>3</sup> / <sub>8</sub>	32	58 <sup>3</sup> / <sub>4</sub>	32 <sup>3</sup> / <sub>8</sub>	52 <sup>3</sup> / <sub>4</sub>	69 <sup>3</sup> / <sub>8</sub>	45 <sup>1</sup> / <sub>8</sub>
Monthly average:												
January, 1930 . . . . .	23 <sup>1</sup> / <sub>2</sub>	55 <sup>3</sup> / <sub>8</sub>	45 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>8</sub>	48 <sup>3</sup> / <sub>4</sub>	43 <sup>3</sup> / <sub>4</sub>	43 <sup>3</sup> / <sub>4</sub>	85 <sup>1</sup> / <sub>4</sub>	64 <sup>3</sup> / <sub>4</sub>	81 <sup>3</sup> / <sub>8</sub>	102 <sup>3</sup> / <sub>8</sub>	75 <sup>3</sup> / <sub>8</sub>
April, " . . . . .	20 <sup>3</sup> / <sub>8</sub>	51 <sup>3</sup> / <sub>8</sub>	44 <sup>1</sup> / <sub>2</sub>	26 <sup>3</sup> / <sub>8</sub>	56 <sup>3</sup> / <sub>8</sub>	40 <sup>3</sup> / <sub>8</sub>	49 <sup>3</sup> / <sub>8</sub>	83 <sup>3</sup> / <sub>8</sub>	64 <sup>1</sup> / <sub>4</sub>	79 <sup>3</sup> / <sub>8</sub>	133 <sup>3</sup> / <sub>2</sub>	93
July, " . . . . .	19 <sup>3</sup> / <sub>8</sub>	39 <sup>3</sup> / <sub>8</sub>	38 <sup>3</sup> / <sub>8</sub>	21	59 <sup>3</sup> / <sub>4</sub>	40 <sup>3</sup> / <sub>8</sub>	51 <sup>3</sup> / <sub>8</sub>	81 <sup>1</sup> / <sub>4</sub>	54 <sup>3</sup> / <sub>8</sub>	66 <sup>3</sup> / <sub>4</sub>	90 <sup>3</sup> / <sub>8</sub>	78 <sup>3</sup> / <sub>8</sub>
October, " . . . . .	14 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>8</sub>	18 <sup>3</sup> / <sub>4</sub>	51 <sup>1</sup> / <sub>2</sub>	44 <sup>1</sup> / <sub>2</sub>	34 <sup>3</sup> / <sub>8</sub>	83 <sup>3</sup> / <sub>2</sub>	42 <sup>3</sup> / <sub>8</sub>	54 <sup>3</sup> / <sub>8</sub>	74	57 <sup>3</sup> / <sub>8</sub>
January, 1931 . . . . .	10	25 <sup>3</sup> / <sub>8</sub>	32 <sup>3</sup> / <sub>8</sub>	13 <sup>3</sup> / <sub>4</sub>	49 <sup>3</sup> / <sub>8</sub>	42 <sup>3</sup> / <sub>2</sub>	30 <sup>3</sup> / <sub>4</sub>	60	29 <sup>3</sup> / <sub>8</sub>	n. q.	65 <sup>3</sup> / <sub>8</sub>	43 <sup>3</sup> / <sub>8</sub>
April, " . . . . .	24 <sup>3</sup> / <sub>8</sub>	28	30 <sup>3</sup> / <sub>8</sub>	16 <sup>3</sup> / <sub>8</sub>	61 <sup>3</sup> / <sub>4</sub>	50 <sup>3</sup> / <sub>8</sub>	35 <sup>1</sup> / <sub>2</sub>	50 <sup>3</sup> / <sub>2</sub>	30 <sup>3</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>2</sub>	69 <sup>3</sup> / <sub>8</sub>	57 <sup>3</sup> / <sub>4</sub>
July, " . . . . .	27 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>4</sub>	26 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>4</sub>	55	48 <sup>3</sup> / <sub>4</sub>	36 <sup>3</sup> / <sub>8</sub>	61	29 <sup>3</sup> / <sub>8</sub>	54	65 <sup>3</sup> / <sub>8</sub>	43
August, " . . . . .	20	28 <sup>3</sup> / <sub>4</sub>	23 <sup>3</sup> / <sub>4</sub>	17	50 <sup>3</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>2</sub>	30 <sup>3</sup> / <sub>8</sub>	44 <sup>1</sup> / <sub>4</sub>	29 <sup>3</sup> / <sub>8</sub>	50 <sup>3</sup> / <sub>8</sub>	66 <sup>3</sup> / <sub>8</sub>	38
September, " . . . . .	19 <sup>3</sup> / <sub>8</sub>	27 <sup>3</sup> / <sub>8</sub>	23 <sup>3</sup> / <sub>8</sub>	18 <sup>3</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>8</sub>	48 <sup>3</sup> / <sub>8</sub>	26 <sup>3</sup> / <sub>8</sub>	43 <sup>3</sup> / <sub>8</sub>	23 <sup>3</sup> / <sub>4</sub>	51 <sup>3</sup> / <sub>8</sub>	79 <sup>3</sup> / <sub>8</sub>	35 <sup>3</sup> / <sub>4</sub>
October, " . . . . .	22 <sup>3</sup> / <sub>8</sub>	26 <sup>3</sup> / <sub>8</sub>	24 <sup>3</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>8</sub>	49 <sup>3</sup> / <sub>2</sub>	50 <sup>3</sup> / <sub>4</sub>	21 <sup>3</sup> / <sub>8</sub>	39 <sup>3</sup> / <sub>4</sub>	24 <sup>3</sup> / <sub>2</sub>	44 <sup>3</sup> / <sub>8</sub>	75 <sup>3</sup> / <sub>8</sub>	35 <sup>3</sup> / <sub>8</sub>
November, " . . . . .	28	27 <sup>3</sup> / <sub>2</sub>	27 <sup>3</sup> / <sub>8</sub>	24	51 <sup>3</sup> / <sub>8</sub>	52 <sup>3</sup> / <sub>8</sub>	24 <sup>3</sup> / <sub>4</sub>	43 <sup>3</sup> / <sub>8</sub>	31 <sup>3</sup> / <sub>4</sub>	47	80 <sup>3</sup> / <sub>4</sub>	40 <sup>3</sup> / <sub>4</sub>
December, " . . . . .	28 <sup>1</sup> / <sub>2</sub>	23 <sup>3</sup> / <sub>4</sub>	25 <sup>3</sup> / <sub>8</sub>	18 <sup>3</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>8</sub>	24	38 <sup>3</sup> / <sub>4</sub>	28 <sup>3</sup> / <sub>8</sub>	42 <sup>3</sup> / <sub>8</sub>	81	35 <sup>3</sup> / <sub>8</sub>

(1) Commercial season: August-July. — (2) Commercial season: November-October.

In limiting this review to typical quotations for a single market or for a very few markets belonging as far as possible to the first rank for each product and to those best suited to illustrating the world situation, there are indicated in table IX the percentage

TABLE IV. — *Prices of Rice, Potatoes, Linseed and Cottonseed in American cents per bushel or per 100 lbs.*

PERIODS	RICE (45 lbs)						POTATOES (60 lbs) (1)			LINSEED (59 lbs)			Cotton-seed (1) (100 lbs.)
	Milan-Mantelli	London American Blue Rose	London Burma, No 2	London Saigon, No 1	London Siam, Garden No 1	Tokio. Various qualities	London King Edward VII	Berlin Red	Amsterdam Zeeuwse	Buenos Aires Current quality	Duluth No 1, Northern	Bombay Bold	
Yearly average													
1928 . . . . .	193 <sup>3</sup> / <sub>8</sub>	212 <sup>3</sup> / <sub>8</sub>	133 <sup>3</sup> / <sub>8</sub>	126 <sup>3</sup> / <sub>8</sub>	148 <sup>1</sup> / <sub>2</sub>	205 <sup>7</sup> / <sub>8</sub>	112 <sup>1</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>8</sub>	90 <sup>7</sup> / <sub>8</sub>	166 <sup>7</sup> / <sub>8</sub>	222 <sup>7</sup> / <sub>8</sub>	190 <sup>7</sup> / <sub>8</sub>	204
1929 . . . . .	210 <sup>1</sup> / <sub>8</sub>	213 <sup>3</sup> / <sub>8</sub>	128 <sup>3</sup> / <sub>8</sub>	129 <sup>3</sup> / <sub>8</sub>	147 <sup>1</sup> / <sub>2</sub>	191 <sup>3</sup> / <sub>8</sub>	54 <sup>5</sup> / <sub>8</sub>	33 <sup>3</sup> / <sub>8</sub>	74 <sup>7</sup> / <sub>8</sub>	194 <sup>1</sup> / <sub>8</sub>	273 <sup>7</sup> / <sub>8</sub>	217 <sup>7</sup> / <sub>8</sub>	178
1930 . . . . .	163 <sup>1</sup> / <sub>8</sub>	212 <sup>3</sup> / <sub>8</sub>	106 <sup>3</sup> / <sub>8</sub>	112 <sup>1</sup> / <sub>2</sub>	136 <sup>7</sup> / <sub>8</sub>	180 <sup>7</sup> / <sub>8</sub>	41 <sup>1</sup> / <sub>8</sub>	27 <sup>3</sup> / <sub>8</sub>	52 <sup>1</sup> / <sub>2</sub>	172 <sup>7</sup> / <sub>8</sub>	236	191 <sup>7</sup> / <sub>8</sub>	127
1931 . . . . .	120 <sup>1</sup> / <sub>8</sub>	170 <sup>1</sup> / <sub>2</sub>	72 <sup>3</sup> / <sub>8</sub>	74 <sup>3</sup> / <sub>8</sub>	86 <sup>3</sup> / <sub>8</sub>	130 <sup>1</sup> / <sub>8</sub>	78 <sup>3</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>8</sub>	91 <sup>1</sup> / <sub>2</sub>	80 <sup>3</sup> / <sub>8</sub>	148	113	94 <sup>3</sup> / <sub>4</sub>
Monthly average													
January, 1931	191 <sup>3</sup> / <sub>8</sub>	209 <sup>3</sup> / <sub>8</sub>	116 <sup>3</sup> / <sub>2</sub>	117 <sup>3</sup> / <sub>8</sub>	138 <sup>3</sup> / <sub>8</sub>	189 <sup>7</sup> / <sub>8</sub>	39 <sup>3</sup> / <sub>8</sub>	29 <sup>7</sup> / <sub>8</sub>	47 <sup>3</sup> / <sub>8</sub>	194 <sup>1</sup> / <sub>8</sub>	307	230 <sup>7</sup> / <sub>8</sub>	140
April, "	182	229 <sup>3</sup> / <sub>8</sub>	117 <sup>3</sup> / <sub>8</sub>	123 <sup>3</sup> / <sub>8</sub>	149 <sup>7</sup> / <sub>8</sub>	192 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>8</sub>	21 <sup>1</sup> / <sub>8</sub>	39 <sup>3</sup> / <sub>8</sub>	196 <sup>1</sup> / <sub>8</sub>	285 <sup>3</sup> / <sub>8</sub>	219 <sup>7</sup> / <sub>8</sub>	138
July, "	178 <sup>1</sup> / <sub>8</sub>	225 <sup>3</sup> / <sub>8</sub>	112 <sup>1</sup> / <sub>2</sub>	113 <sup>3</sup> / <sub>8</sub>	147 <sup>1</sup> / <sub>2</sub>	205	n. q.	n. q.	n. q.	156 <sup>7</sup> / <sub>8</sub>	209	184 <sup>1</sup> / <sub>2</sub>	114
October, "	135 <sup>3</sup> / <sub>8</sub>	192 <sup>3</sup> / <sub>8</sub>	98 <sup>3</sup> / <sub>8</sub>	100 <sup>1</sup> / <sub>8</sub>	n. q.	134 <sup>3</sup> / <sub>8</sub>	68	17 <sup>3</sup> / <sub>8</sub>	76	125 <sup>3</sup> / <sub>8</sub>	177 <sup>1</sup> / <sub>8</sub>	160 <sup>3</sup> / <sub>8</sub>	101
January, 1930	115 <sup>3</sup> / <sub>8</sub>	180 <sup>3</sup> / <sub>8</sub>	79	77 <sup>3</sup> / <sub>8</sub>	98 <sup>3</sup> / <sub>8</sub>	125 <sup>3</sup> / <sub>8</sub>	71 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	92 <sup>7</sup> / <sub>8</sub>	81 <sup>7</sup> / <sub>8</sub>	157 <sup>1</sup> / <sub>8</sub>	122 <sup>7</sup> / <sub>8</sub>	97
April, "	127 <sup>1</sup> / <sub>8</sub>	173 <sup>3</sup> / <sub>8</sub>	72 <sup>1</sup> / <sub>8</sub>	71 <sup>3</sup> / <sub>8</sub>	88 <sup>3</sup> / <sub>8</sub>	130 <sup>3</sup> / <sub>8</sub>	107 <sup>3</sup> / <sub>8</sub>	26 <sup>3</sup> / <sub>8</sub>	114	88 <sup>3</sup> / <sub>8</sub>	155 <sup>3</sup> / <sub>8</sub>	132 <sup>3</sup> / <sub>8</sub>	106 <sup>3</sup> / <sub>8</sub>
July, "	116 <sup>3</sup> / <sub>8</sub>	175 <sup>3</sup> / <sub>8</sub>	70 <sup>3</sup> / <sub>8</sub>	72 <sup>1</sup> / <sub>8</sub>	78 <sup>3</sup> / <sub>8</sub>	142 <sup>3</sup> / <sub>8</sub>	74 <sup>3</sup> / <sub>8</sub>	25 <sup>3</sup> / <sub>8</sub>	n. q.	92 <sup>1</sup> / <sub>8</sub>	162 <sup>3</sup> / <sub>8</sub>	122 <sup>3</sup> / <sub>8</sub>	85 <sup>3</sup> / <sub>8</sub>
August, "	103 <sup>1</sup> / <sub>8</sub>	171 <sup>3</sup> / <sub>8</sub>	85 <sup>3</sup> / <sub>8</sub>	86 <sup>3</sup> / <sub>8</sub>	94 <sup>3</sup> / <sub>8</sub>	148 <sup>3</sup> / <sub>8</sub>	65 <sup>3</sup> / <sub>8</sub>	21	85 <sup>3</sup> / <sub>8</sub>	81	141	111	78 <sup>3</sup> / <sub>8</sub>
September, "	111 <sup>1</sup> / <sub>8</sub>	167	80 <sup>3</sup> / <sub>8</sub>	79 <sup>3</sup> / <sub>8</sub>	88 <sup>3</sup> / <sub>8</sub>	137 <sup>3</sup> / <sub>8</sub>	55 <sup>3</sup> / <sub>8</sub>	18 <sup>3</sup> / <sub>8</sub>	85 <sup>3</sup> / <sub>8</sub>	71 <sup>3</sup> / <sub>8</sub>	134 <sup>3</sup> / <sub>8</sub>	104 <sup>3</sup> / <sub>8</sub>	89 <sup>3</sup> / <sub>8</sub>
October, "	139	143 <sup>3</sup> / <sub>8</sub>	65 <sup>3</sup> / <sub>8</sub>	67 <sup>3</sup> / <sub>8</sub>	88 <sup>3</sup> / <sub>8</sub>	123 <sup>3</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>8</sub>	80 <sup>3</sup> / <sub>8</sub>	65 <sup>3</sup> / <sub>8</sub>	129 <sup>3</sup> / <sub>8</sub>	87 <sup>3</sup> / <sub>8</sub>	84 <sup>3</sup> / <sub>8</sub>
November, "	148 <sup>1</sup> / <sub>8</sub>	151 <sup>3</sup> / <sub>8</sub>	64 <sup>3</sup> / <sub>8</sub>	70 <sup>3</sup> / <sub>8</sub>	81	125 <sup>3</sup> / <sub>8</sub>	64 <sup>3</sup> / <sub>8</sub>	20 <sup>7</sup> / <sub>8</sub>	84 <sup>1</sup> / <sub>2</sub>	72 <sup>3</sup> / <sub>8</sub>	141 <sup>7</sup> / <sub>8</sub>	87 <sup>3</sup> / <sub>8</sub>	88 <sup>3</sup> / <sub>8</sub>
December, "	146	154	61 <sup>1</sup> / <sub>8</sub>	67 <sup>1</sup> / <sub>8</sub>	n. q.	114 <sup>3</sup> / <sub>8</sub>	71 <sup>1</sup> / <sub>8</sub>	22	85 <sup>3</sup> / <sub>8</sub>	64 <sup>1</sup> / <sub>2</sub>	138	81 <sup>1</sup> / <sub>2</sub>	74 <sup>1</sup> / <sub>8</sub>

(1) Commercial season: August-July. — Commercial season: November-October.

TABLE V. — *Prices of Fibres and of Rubber, in American dollars per 100 lbs.*

PERIODS	COTTON (1)				FLAX FIBER (2)		FLAX (2)	HEMP (2)	JUTE	MA-NILA HEMP (1)	RUBBER	
	New Orleans Middling	Liverpool Am. Middling	Liverpool M. g. Broach f. g.	Liverpool Sakellardis f. g. f.	Riga Livonia L.	London Riga Z. K.	Belgium Unmanufactured	Italy Current quality	London "Is" grade	London First Marks	London Plantation crepe	New York Ribbed, smoked sheet
Yearly average												
1928 . . . . .	19.97	22.65	19.49	39.42	22.68	21.88	2.76	13.01	8.17	7.99	21.79	22.25
1929 . . . . .	18.98	21.35	17.60	36.84	...	17.97	2.62	11.91	8.04	7.39	20.74	20.37
1930 . . . . .	16.17	18.43	13.70	29.44	13.67	12.32	1.67	9.31	5.72	5.30	11.90	12.00
1931 . . . . .	10.06	11.64	8.58	18.38	8.31	7.53	0.70	5.25	3.76	3.50	6.04	6.12
Monthly average												
January, 1930	16.76	19.00	14.21	29.26	13.39	12.52	2.12	10.81	7.54	6.73	14.97	15.12
April, "	15.83	17.72	12.47	28.79	13.34	13.04	1.60	9.10	6.37	6.38	14.97	15.00
July, "	12.72	15.47	10.26	25.08	12.86	12.21	0.95	8.01	5.21	5.45	11.38	11.18
October, "	10.45	11.88	8.56	19.61	10.42	8.69	0.83	6.50	5.15	3.54	8.14	8.22
January, 1931	9.89	11.12	8.23	16.72	7.09	6.83	0.66	5.16	4.46	3.33	8.49	8.25
April, "	9.98	11.38	8.75	17.77	8.31	7.79	0.69	5.08	4.11	3.50	6.21	6.37
July, "	9.10	10.24	8.40	15.58	7.96	7.44	1.03	5.08	3.94	3.80	6.21	6.25
August, "	7.00	7.88	6.48	12.17	8.23	7.26	1.05	5.25	3.68	3.41	5.08	5.50
September, "	6.21	7.53	6.13	11.64	8.05	7.26	0.97	5.08	3.68	3.59	5.34	5.06
October, "	6.04	7.61	6.65	11.55	7.09	6.91	0.89	4.99	3.24	3.38	4.73	4.75
November, "	6.30	7.70	7.00	11.47	6.56	6.48	0.88	5.16	3.50	2.89	4.73	4.50
December, "	6.13	7.53	6.91	10.24	6.56	6.21	...	4.93	3.24	3.24	4.61	4.62

(1) Commercial season: August-July — (2) Commercial season: October-September.

declines in prices of December and January 1931 with respect to the average prices of 1928 (or of the commercial season 1927-28) and in those of December 1931 with respect to those of January 1931

TABLE VI. — *Prices of various tropical products, in American dollars per 100 lbs*

PERIODS	COPRA		COFFEE				CACAO		TEA (per lb.)			SUGAR		
	London Ceylon	New York, Pacific	Santos No 4 Santos	Le Havre : Columbian Washed	London : Kenya	Rotterdam : Robusta	London : Acra	London Trinidad	London : North India	London : Ceylon	London : Java	London White Java (c. i. f.)	New York : Cuba centrifugal 96° (c. & f.)	
Yearly average :														
1928	6.07	5.08	19.45	24.07	..	18.00	13.32	15.81	0.33	0.38	0.25	2.90	2.45	
1929	5.26	4.45	18.72	25.19	23.86	18.50	10.21	13.03	0.32	0.39	0.24	2.59	1.99	
1930	4.38	3.70	10.87	18.26	26.11	11.07	8.16	12.98	0.30	0.38	0.21	1.96	1.47	
1931	3.02	2.34	5.33	18.80	17.20	9.12	5.03	9.07	0.23	0.25	0.14	1.63	1.34	
Monthly average :														
January 1930	5.22	4.37	12.21	19.26	29.27	12.76	9.07	13.58	0.28	0.37	0.20	2.36	1.97	
April, "	5.01	4.33	11.59	18.90	28.79	12.76	8.96	13.47	0.31	0.45	0.22	2.15	1.68	
July, "	4.23	3.59	10.36	17.84	27.16	11.49	8.33	13.58	0.26	0.35	0.20	1.79	1.26	
October, "	3.62	2.96	9.49	17.59	19.01	10.57	6.73	11.84	0.34	0.41	0.24	1.70	1.32	
January, 1931	3.52	2.79	6.66	17.77	18.79	10.21	6.19	10.75	0.29	0.37	0.23	1.72	1.39	
April, "	3.44	2.76	6.29	17.94	19.01	9.02	4.83	9.78	0.24	0.38	0.15	1.70	1.29	
July, "	2.93	2.35	5.97	19.19	16.51	9.84	5.43	9.45	0.16	0.22	0.12	1.70	1.40	
August, "	2.73	2.12	4.91	19.19	16.08	9.30	5.43	9.12	0.19	0.27	0.13	1.68	1.48	
September "	2.73	1.95	4.35	18.83	15.21	8.66	5.11	8.80	0.32	0.31	0.13	1.68	1.40	
October "	2.49	1.91	3.54	18.12	13.52	8.39	4.57	6.98	..	..	..	1.42	1.42	
November "	2.64	2.13	4.22	18.48	13.59	8.39	4.48	7.46	0.19	0.28	0.14	1.42	1.36	
December, "	2.02	2.03	4.39	16.70	13.46	8.39	4.15	7.08	0.15	0.25	0.12	1.33	1.14	

TABLE VII. — *Meat prices, in American dollars per 100 lbs.*

PERIODS	STEERS OR BEEF						MUTTON		PIGS, live weight					
	Steers, live weight		Steers, dead weight		Other		Fresh, dead weight		Pigs, live weight					
	Berlin	Chicago	Paris	London	London : Argentine chilled	London : Australian frozen	Paris	London						
									Denmark	Rotterdam	Warsaw	Berlin	Chicago	
Yearly average :														
1928	12.34	14.65	12.80	18.03	15.24	10.65	21.61	24.46	16.53	12.60	10.85	13.93	9.53	
1929	12.23	14.03	15.46	17.77	15.64	11.41	25.39	23.35	19.33	15.14	12.17	17.16	10.26	
1930	12.39	12.37	18.22	18.12	15.52	11.66	26.30	24.39	14.03	15.80	11.99	10.83	9.05	
1931	9.63	8.97	16.54	15.49	13.04	7.44	23.98	19.87	10.59	9.45	7.79	6.74	6.16	
Monthly average :														
January, 1930	12.36	14.14	15.09	18.29	16.17	13.69	26.51	23.32	16.28	18.72	14.44	12.08	9.78	
April, "	12.40	14.23	17.13	18.99	14.81	12.42	26.92	24.57	14.45	19.08	12.95	12.17	10.00	
July, "	12.92	10.00	19.80	19.08	16.98	10.65	25.48	24.73	12.67	15.44	11.47	9.71	8.73	
October, "	11.91	11.24	19.44	16.72	15.41	11.41	26.78	24.33	14.09	12.03	10.59	8.93	9.94	
January, 1931	11.82	11.34	19.52	16.63	14.44	9.71	27.66	21.97	12.25	10.68	8.58	6.48	7.65	
April, "	10.50	8.74	17.69	16.72	13.04	7.00	26.96	23.54	10.06	11.64	7.35	6.21	7.26	
July, "	10.41	7.89	16.93	18.73	13.83	6.74	25.21	23.28	11.99	9.63	8.05	9.01	6.33	
August, "	10.33	8.86	16.98	17.24	15.84	7.96	22.98	21.27	11.73	11.20	8.66	8.68	5.98	
September "	8.40	8.55	15.75	15.75	15.23	8.40	22.76	20.30	13.13	9.89	8.05	7.96	5.41	
October "	7.88	8.93	14.62	12.43	11.90	7.00	19.95	14.79	9.54	7.96	7.88	6.74	5.09	
November "	7.88	9.64	13.57	11.20	9.98	6.39	17.59	13.30	8.05	6.33	7.79	4.99	4.61	
December, "	7.79	8.87	14.09	10.41	9.28	5.34	17.68	11.55	6.83	5.25	6.83	4.99	4.20	

As may be seen from these figures, the decline which had already been very great for the majority of commodities during the year 1930, has continued and in many cases been accentuated, the level reached at the end of 1931 being lower, in some cases much lower, than at the beginning of 1931.

The fall was relatively small during last year for wheat and for some textile crops (flax, hemp, jute) the cultivation of which was greatly reduced in 1931; for rye, barley and oats, the crops of which were deficient, there was even some recovery in prices in the latter half of the year. The prices of all these products, at the end of 1931, however, were still below those of 1928 by 60-70 %.

Among the products of the soil, prices of which continued to fall especially sharply during last year, may be mentioned cotton, Manila hemp, oilseeds coffee, cacao, tea and rubber. The prices of these products at the end of 1931 were 30-40 % below those at the beginning of the year except in some cases for the finer qualities, prices of which were better maintained.

Prices of wool and silk fell to much the same extent.

TABLE VIII. — *Prices of various Livestock products, in American dollars per 100 lbs.*

PERIODS	WOOL	SILK (per lb.)		BUTTER					CHEESE				EGGS per 100	
	London: Victoria	Milan: Unmanufactured	Yokohama: Saityaku	Copenhagen: Official quotation	Maastricht: Butter with quality mark	Hamburg: S. H. Butter with quality mark	London: Argentine	London: New Zealand, salted	Milan: Parmigiano Reggiano	Alkmaar: Edam, 40 +	Switzerland: Emmenthal (1)	London: New Zealand	London: Danish	London: Dutch
Yearly average:														
1928 . . . . .	50.60	5.23	4.99	38.17	30.02	40.02	37.37	39.00	25.95	18.20	22.93	23.03	3.67	3.68
1929 . . . . .	38.53	4.74	4.67	36.83	38.11	38.48	37.03	38.83	25.65	17.17	22.58	20.73	—	3.95
1930 . . . . .	26.36	3.15	3.26	29.78	30.99	31.70	29.51	29.01	27.69	14.91	20.30	17.85	3.21	3.46
1931 . . . . .	18.99	2.28	2.22	23.89	25.12	28.36	23.98	24.42	26.34	11.90	19.25	12.87	2.68	2.71
Monthly average:														
January, 1930 . . . . .	34.47	4.12	4.43	34.76	37.38	35.18	34.07	35.54	27.16	16.63	20.83	19.50	3.46	4.21
April, " . . . . .	25.35	3.64	4.27	27.35	28.44	29.30	29.33	29.00	26.71	14.22	20.83	17.70	2.59	2.69
July, " . . . . .	25.35	2.55	2.66	30.15	31.72	32.38	29.87	30.85	30.74	14.90	20.83	17.98	2.96	3.06
October " . . . . .	24.33	2.61	2.16	29.00	30.45	32.04	27.55	27.46	26.26	14.66	19.78	16.53	3.67	3.99
January, 1931 . . . . .	19.25	2.70	2.71	26.78	29.49	30.54	25.04	26.34	26.26	12.60	18.78	13.83	3.45	3.77
April, " . . . . .	23.28	2.35	2.30	24.42	26.08	27.74	25.56	25.47	26.52	11.90	18.78	12.34	2.18	2.26
July, " . . . . .	19.25	2.23	2.22	23.11	24.42	27.31	25.29	25.82	28.27	13.74	19.87	13.65	2.23	2.57
August " . . . . .	19.78	2.27	n. q.	24.42	24.24	28.62	25.21	25.91	29.23	13.74	19.87	14.18	2.38	2.52
September " . . . . .	18.73	2.17	2.20	25.20	23.89	28.62	25.38	25.47	26.26	12.69	19.87	14.09	2.59	2.75
October " . . . . .	15.67	2.12	2.07	21.18	22.58	28.27	20.88	21.97	26.26	10.76	19.87	12.43	2.41	2.68
November " . . . . .	15.49	2.02	2.13	19.78	21.53	25.99	19.25	20.30	22.98	9.98	19.87	11.82	3.29	3.20
December " . . . . .	14.35	1.91	1.81	18.64	21.70	25.03	16.45	17.15	22.75	8.05	19.87	10.33	2.92	n. q.

(1) Prices guaranteed by the «Central Union of Swiss Milk Producers».

Prices of livestock products for food (meat, dairy products) which in many cases were maintained fairly well until the end of 1930, also fell strongly in 1931, especially during the last few months of the year. The reductions mostly exceed 30 % and sometimes approach 50 %. It should be observed that prices of pigs which are known to oscillate in a short period cycle, in 1928 touched a low point followed by a recovery in 1929 so that the reduction of prices in December 1931 compared with 1928 is much less than that since 1929; the latter is about 75 %.

In this way important branches of agriculture the situation of which remained relatively good until just recently are now also severely hit by the crisis.

Comparison with the average prices of 1928 (or with the commercial season 1927-28) shows that at the end of 1931, the reduction of prices on the markets not immediately

influenced by Government intervention was below 50 % only in some exceptional cases ; in many cases it reached or exceeded  $\frac{2}{3}$  or even  $\frac{3}{4}$ .

The fall in prices of agricultural products was caused and aggravated largely by the same factors and along the same lines as that of other products.

TABLE IX. — *Fall of prices of different agricultural products.*

PRODUCTS, MARKETS AND DESCRIPTIONS		% Fall of prices		
		compared with the prices of 1928 (or commercial season 1927-28)		compared with the prices of January 1931
		December 1931	January 1931	December 1931
Wheat . . . . .	Winnipeg N° 1 Manitoba . . . . .	66	63	7
" . . . . .	Buenos Aires, Barletta . . . . .	67	62	13
" . . . . .	Liverpool and London, Australian . . . . .	61	56	12
Rye . . . . .	Minneapolis, N° 2 . . . . .	57	64	22
" . . . . .	Danmark, imported . . . . .	60	61	4
Barley . . . . .	Braila, Home grown . . . . .	56	67	35
" . . . . .	Winnipeg, N° 4 Western . . . . .	64	77	56
Oats . . . . .	Winnipeg, N° 2 White . . . . .	62	61	3
" . . . . .	Buenos Aires, Current quality . . . . .	66	75	33
Maize . . . . .	Braila, Danube . . . . .	77	71	21
" . . . . .	Buenos Aires, Yellow Plate . . . . .	69	67	5
Rice . . . . .	London, American Blue Rose . . . . .	28	15	14
" . . . . .	London, Burma, N° 2 . . . . .	54	41	23
Linseed . . . . .	Buenos Aires, Current quality . . . . .	61	51	21
" . . . . .	Bombay, Bold . . . . .	57	35	34
Cottonseed . . . . .	Alexandria, Sakellaridis . . . . .	64	52	24
Cotton . . . . .	New Orleans, Middling . . . . .	69	50	38
" . . . . .	Liverpool, Broach m. g. f. g. . . . .	65	58	16
" . . . . .	Liverpool, Sakellaridis . . . . .	74	58	39
Flax . . . . .	Riga, Livonia, « L <sub>1</sub> » . . . . .	71	69	7
Unmanufactured flax . . . . .	Belgium, Average quality . . . . .	(1) 69	76	(1) + 30
Hemp . . . . .	Italy, Average, quality . . . . .	62	60	4
Manila Hemp . . . . .	London, « J 2 » grade . . . . .	60	45	26
Jute . . . . .	London First Marks . . . . .	59	58	3
Rubber . . . . .	New York, ribbed smoked sheets . . . . .	70	63	44
Copra . . . . .	New York, Pacific . . . . .	60	45	28
Coffee . . . . .	Santos, N° 4 Santos . . . . .	77	66	31
" . . . . .	Le Havre, Columbian washed . . . . .	31	22	6
Cacao . . . . .	London, Accra . . . . .	69	53	33
Tea . . . . .	London, Ceylan . . . . .	35	5	32
" . . . . .	London, Java . . . . .	54	11	48
Sugar . . . . .	New York, Cuba centrifugal 96° . . . . .	53	43	18
Beef . . . . .	London, fresh, dead weight . . . . .	42	8	37
" . . . . .	London, Argentine, chilled . . . . .	39	5	36
" . . . . .	London, Australian, frozen . . . . .	50	9	45
Mutton . . . . .	London, fresh, dead weight . . . . .	53	10	47
" . . . . .	London, New Zealand frozen . . . . .	57	23	44
Pork, live weight . . . . .	Danmark, Home grown . . . . .	68	35	51
" . . . . .	Warsaw, Home grown . . . . .	54	40	23
" . . . . .	Chicago, Home grown . . . . .	56	20	44
Wool . . . . .	London, Victoria . . . . .	72	62	25
Silk . . . . .	Milan, Unmanufactured « Classiche » . . . . .	63	48	29
Butter . . . . .	Copenhagen . . . . .	51	30	30
" . . . . .	London, Argentine . . . . .	56	31	36
" . . . . .	London, New Zealand . . . . .	56	33	35
Cheese . . . . .	Milan Parmigiano-Reggiano . . . . .	12	+ 1	13
" . . . . .	Alkmaar, Edam . . . . .	50	31	36
" . . . . .	London, New Zealand . . . . .	55	40	25
Eggs . . . . .	London, Danish . . . . .	(2) 42	(3) 36	(4) 38

(1) Comparison of price for November. — (2) Compared with price for December, 1928. — (3) Compared with price for January, 1928. — (4) Compared with price for December, 1930.

But, since from 1928 to the end of 1931, the general index-numbers of prices — which, however, also take into account the prices of agricultural products — have fallen generally in the different countries by only about 30-35 %, there is reason to admit that the fall has been much larger for agricultural products than for other commodities as a whole, which explains the particularly serious state of agricultural economy at present in all countries.

J. P. v. A.

## MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTIONS	Feb. 19, 1932	Feb. 12, 1932	Feb. 5, 1932	Jan. 29, 1932	Jan. 22, 1932	Average (2)			Commercial Season	
						Jan. 1932	Feb. 1932	Feb. 1930	1930-31	1929-30
<b>WHEAT.</b>										
Budapest (b): Tisza región (78-80 kg. p. hl.; pengő p. 100 kg.) . . . . .	13.37	12.82	12.92	13.88	13.37	13.27	15.01	23.68	15.34	22.94
Braila: Home grown (79-80 kg. p. hl.; lei p. 100 kg.) . . . . .	...	...	...	...	...	...	336	632	351	612
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.) . . . . .	65	61 1/2	60 1/4	61	59 3/4	60 1/2	59 1/2	117 1/4	64 1/4	124 1/2
Chicago: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	61	57 1/4	58	59 1/4	59 1/2	57 1/2	79	115 1/4	78	114 1/4
Minneapolis: No. 1 Northern (cents p. 60 lbs.) . . . . .	74 1/2	72 1/2	72 1/4	73 1/2	73 3/4	72 3/4	75 1/2	122 1/4	77 1/2	117 1/2
New York: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	73 1/4	(3) 70	70	72	71 1/4	70 1/4	n. q.	119 1/4	n. q.	121 1/4
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper per quintal) . . . . .	0.80	6.40	6.30	6.05	6.25	6.26	6.10	10.95	6.83	10.65
Karachi: Karachi white, 2 % barley, 1 1/2 % dirt (rupees per 656 lbs.) . . . . .	24-8-0	24-4-0	25-12-0	24-8-0	25-12-0	25-8-0	19-7-9	36-2-6	19-15-2	36-6-9
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	24.80	24.50	24.20	23.70	23.20	22.87	27.42	23.80	26.00	25.33
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No. 3 Manitoba . . . . .	(4) 11.05	(4) 10.71	(4) 10.58	(4) 10.37	(4) 10.45	(4) 10.34	(4) 12.52	20.48	—	21.30
No. 2 Hardwinter . . . . .	n. q.	n. q.	n. q.	(5) 11.13	n. q.	(5) 10.19	n. q.	19.34	n. q.	19.49
Barusso (79 kg. p. hectol.) . . . . .	(6) 9.09	(6) 8.58	8.33	(6) 8.07	(6) 8.33	8.46	9.84	18.07	11.10	18.72
Antwerp (Belgian francs p. quintal):										
Home grown . . . . .	75	74	74	74	74	74 1/4	75	147	95 1/2	154 1/4
No. 2 Hard Winter, Gulf . . . . .	(5) 84 1/2	(5) 82 1/2	(5) 83	(5) 83	(5) 81	(5) 82 1/2	116	172 1/2	112 1/2	171
Paris: Home grown, 75-77 kg. (francs p. quintal) . . . . .	172.50	172.50	170.00	167.00	167.75	167.45	176.75	129.50	175.00	139.40
London: Home grown (shillings per 504 lbs.) . . . . .	25/6	25/6	25/6	25/6	25/6	26/-	22/1	38/6	27/1	40/10
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):										
South Russian (on sample) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	22/1	n. q.	23/7	n. q.
No. 3 Manitoba . . . . .	30/3	28/6	28/-	26/-	27/-	27/3	n. q.	24/8	25/4	45/2
No. 2 Hard Winter . . . . .	n. q.	(7) 27/6	(7) 27/6	(7) 27/3	(7) 28/8	(7) 27.10	n. q.	40/10	26/4	41/5
White Pacific . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	24/7	41/-	26/7	42/3
Rosafe (63 1/2 lbs.), afloat . . . . .	(8) 26/10	(8) 25/12	(8) 24/9	(8) 23/7 1/2	(8) 24/6	(8) 24/8	21/-	39/2	23/5	40/3
Choice White Karachi . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	43/5	27/-	42/2
Australian . . . . .	28/9	27/3	26/6	26/6	27/-	27/3	21/10	41/7	25/7	43/6
Milan (b): Home grown, soft (liras p. quintal) . . . . .	118.00	114.00	112.00	110.00	110.00	110.00	107.85	132.50	109.10	131.30
Genoa c. i. f. (shillings p. metric ton): La Plata . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	96/4	178/3	110/-
<b>RYE.</b>										
Budapest (b): Home grown (pengő p. 100 kg.) . . . . .	14.00	13.45	12.75	13.75	13.80	13.84	10.74	n. 12.75	10.79	13.44
Berlin: Home grown (Reichsmarks per quinta) . . . . .	20.10	19.60	19.90	19.70	19.90	19.67	15.79	16.07	17.18	17.04
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. 100 kg.) . . . . .	8.37	8.24	8.11	8.07	8.24	8.18	n. q.	14.42	n. q.	14.57
Minneapolis: No. 2 (cents per 56 lbs.) . . . . .	47	46 1/2	46	47	47	46 1/4	36 1/2	78	42 1/4	80 1/2
Groningen (c): Home grown (florins per quintal) . . . . .	4.65	4.70	5.00	5.25	5.25	5.17	3.82	5.24	4.45	6.33
<b>BARLEY.</b>										
Braila: Home grown (62-63 kg. p. hl.; lei p. 100 kg.) . . . . .	...	...	...	...	...	...	214	295	232	304
Winnipeg: No. 4 Western (cents p. 48 lbs.) . . . . .	37 1/4	36 1/4	35 1/2	34 1/4	35 1/4	(9) 35 1/4	19 1/4	46 1/4	26 1/4	51 1/4
Chicago: Feeding (cents per 48 lbs.) . . . . .	50	48	49	50	50	46 1/4	41	80	48 1/4	57 1/4
Berlin: Home grown fodder (Reichsmarks per quintal) . . . . .	15.85	15.50	15.50	15.55	15.55	15.47	19.77	14.42	19.52	17.40
Antwerp: Danube (francs per quintal) . . . . .	77 1/2	76	78	78	79 1/2	79 1/4	66	102 1/2	73 1/4	107 1/2
London: English malting (shillings p. 448 pounds) . . . . .	37/6	37/6	37/6	37/6	37/6	38/1	38/7	39/4	35/8	39/-
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):										
Danubian 3 % . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	14/9	21/1	15/2	22/3
Russian (Azoff-Black sea) . . . . .	24/3	23/9	22/-	n. q.	22/6	22/9	13/1	20/1	14/3	13/11
Canadian Western, No. 3 . . . . .	23/6	23/-	21/9	22/-	23/-	23/3	14/8	23/4	15/11	27/-
Californian malting (shillings p. 448 lbs.) . . . . .	39/-	38/6	38/6	39/6	39/6	40/4	10/24/10	30/11	27/8	32/6
Groningen (c): Home grown winter (fl. p. quintal) . . . . .	5.50	5.50	5.55	5.80	5.85	5.76	4.50	6.29	4.97	7.55

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) 11 February. — (4) No. 2 Manitoba. — (5) No. 1 Hard Winter. — (6) 80 kg. p. hl. — (7) Without indication of quality. — (8) 64 lbs. per bushel. — (9) 15 January: 35 1/4. — (10) Shipping March-April.

PRODUCTS, MARKETS AND DESCRIPTION	Feb.	Feb.	Feb.	Jan.	Jan.	Average (x)							
	19,	12,	5,	29,	22,	Jan.	Feb.	Feb.	Commercial				
	1932	1932	1932	1932	1932					1932	1931	1930	Season
												1930-31	1929-30
OATS.													
Braila : Home grown (43-44 kg. p. hl.; lei p. 100 kg.)	...	...	...	...	...	...	219	241	247	256			
Winnipeg : No. 2 White (cents per 34 lbs.) . . .	29 7/8	29 3/8	29	29 7/8	29 7/8	29 7/8	27 7/8	60	30	58 3/8			
Chicago : No. 2 White (cents per 32 lbs.) . . .	25 1/2	24 3/4	25 1/4	25 3/4	26 1/2	26	32 3/4	44 3/4	32 7/8	44 1/8			
Buenos Aires (a) : Current quality (pesos paper per quintal) . . . . .	5.05	4.80	4.70	4.45	4.50	4.50	3.26	4.85	3.58	5.80			
Berlin : Home grown (Reichsmarks per quintal) .	15.35	14.60	14.20	14.30	14.20	14.05	14.35	12.81	16.17	15.62			
Paris : Home grown, black and other (francs per quintal) . . . . .	106.00	106.00	104.00	103.50	102.50	101.50	79.75	73.00	81.00	81.15			
London : Home grown white (shillings per 336 lbs.)	21/-	21/-	21/-	21/-	21/-	20/10	17/6	19/-	18/4	21/-			
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.) :													
Danubian (39-40 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n.	12/1	3) n. 16/4		
Plate (f. a. q.) . . . . .	15/-	14/3	14/-	14/-	13/7 1/2	14/3	9/4	14/1	10/9	16/1			
Chilian Tawny . . . . .	n. q.	(4) 17/8	n. q.	17/-	18/-	17/10	10/7	5) 15/4	12/-	17/8			
Milan (b) : spot (liras per quintal) :													
Home grown . . . . .	76.50	76.50	76.50	76.50	76.50	76.50	73.50	83.75	73.95	80.75			
Foreign imported . . . . .	64.00	66.00	66.00	67.50	65.00	66.60	57.00	70.00	60.40	74.30			
MAIZE.													
Braila : Danube (lei per quintal) . . . . .	...	...	...	...	...	...	203	276	210	300			
Chicago : No. 2 Mixed American (cents per 56 lbs.)	38	36 3/4	36 3/8	30	38 3/4	38 3/4	61 7/8	84 1/2	58 1/4	85 7/8			
Buenos Aires (a) : Yellow Plate (pesos paper per quintal) . . . . .	4.42	4.20	4.05	4.00	4.20	4.17	3.81	6.30	3.82	6.17			
Antwerp, spot (Belgian francs per quintal) :													
Bessarabian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	67	n. q.	71 1/4	n. 97 3/4			
Cinquantino . . . . .	55 1/2	53	53 1/2	54 1/2	55	55 1/2	39 3/4	120	81	131 1/4			
Yellow Plate . . . . .	54	50	50 1/2	51	51	52	64	106	65	109 1/4			
London and Liverpool, parcels, c. i. f. (shillings per 480 lbs.) :													
Danube . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	5) 25/7	n.	17/4	24/11		
Yellow Plate . . . . .	19/-	18/-	17/6	15/9	17/-	16/11	15/4	25/1	15/6	25/8			
No. 2 White African . . . . .	n. q.	n. q.	n. q.	21/6	21/6	21/6	n. q.	27/2	n.	18/11	26/-		
Milan (b) : Home grown (liras per quintal) . . .	66.50	64.50	63.50	63.50	65.50	63.75	49.50	73.25	51.00	71.35			
RICE (CLEANED).													
									1931	1930			
Milan (b) : Maratelli (lire per quintal) . . . . .	146.00	146.00	145.00	146.50	147.50	147.25	110.00	173.25	117.35	152.15			
Rangoon : No. 2 Burma (rupees per 7500 lbs.) .	n. q.	285	262 1/2	205	265	261 7/8	236	388 3/4	249 3/4	303 3/4			
Saigon (Indochinese piastres p. quintal) :													
No. 1 Round white (25 % broken) . . . . .	6.23	n. q.	6.15	6.06	6.15	6.12	7.10	11.88	6.73	11.36			
No. 2 Japan (40 % broken) . . . . .	5.73	n. q.	5.65	5.57	5.73	5.69	6.42	11.47	6.20	10.89			
London (a) : c. i. f. (shillings per 112 lbs.) :													
Spanish Belloch, No. 3 oiled . . . . .	14/1 1/2	14/4 1/2	14/3	14/3	14/7 1/2	14/3	11/7	15/3	11/11	14/1			
Italian good, No. 6 oiled . . . . .	13/4 1/2	13/6	13/3	13/3	13/4 1/2	13/10	12/3	16/8	13/7	14/11			
American Blue Rose . . . . .	19/-	19/6	19/6	20/-	20/6	20/9	18/10 1/2	23/6	18/7	21/9			
Burma, No. 2 . . . . .	9/-	9/1 1/2	8/7 1/2	8/7 1/2	8/6	8/7	7/6	11/-	7/11	10/11			
Saigon, No. 1 . . . . .	9/7 1/2	9/6	9/4 1/2	9/4 1/2	9/6	9/7	7/10	11/10	8/1	11/6			
Siam, Garden, No. 1 . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	9/5	13/11	9/5	14/-			
Tokio : Various qualities (yens per koku) . . . .	22.60	22.40	22.60	22.60	21.60	21.62	17.70	27.40	18.46	25.57			
LINSEED.													
Buenos Aires (a) : Current quality (pesos paper per quintal) . . . . .	9.60	9.15	9.20	9.10	9.30	9.20	10.96	19.42	10.82	17.19			
Antwerp : Plate (Belgian francs p. quintal) . . .	104	104	107	109	106	108 1/2	164	306 1/2	146	284 1/4			
Hull, c. i. f. : Plate (p. sterling p. 1. ton) . . . .	9-2-6	8-12-6	8-12-6	8-11-3	8-16-3	8-14-4	0-1-3	17-5-4	8-14-1	15-0-5			
London, c. i. f. : Bombay bold (p. st. per long ton).	14-0-0	n. 12-7-6	n. 12-2-6	n. 12-0-0	12-5-0	11-18-5	n. q.	19-11-10	11-0-6	17-14-4			
Duluth : No. 1, Northern (cents p. 56 lbs.) . . .	(6) 141	(6) 137	(6) 137 1/4	(6) 137 1/4	(6) 137	(6) 137 1/4	(6) 156	(6) 303 1/2	148	286			

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) 15 January: 29 1/4. —

(3) Weight not indicated. — (4) Chilian, Mixed Black. — (5) Shipping March-April. — (6) May delivery. — (7) 11 February.



PRODUCTS, MARKETS AND DESCRIPTION	Feb. 19, 1932	Feb. 12, 1932	Feb. 5, 1932	Jan. 29, 1932	Jan. 22, 1932	Average (1)				Commercial Season	
	Jan. 1932	Feb. 1931	Feb. 1930	Jan. 1932	Jan. 1932	Jan. 1932	Feb. 1931	Feb. 1930		1930-31	1929-30
<b>COTTONSEED.</b>											
Alexandria: Sakellaridis (piastres per ardeb) . . . .	64.6	62.0	62.8	59.7	58.7	58.4	57.2	70.5		52.2	67.9
Hull: Sakellaridis (p. sterl. per long ton) . . . .	6-15-0	6-10-0	6-8-0	6-2-6	6-1-3	6-0-4	6-1-3	7-5-0		5-12-6	6-18-2
<b>COTTON.</b>											
New Orleans: Middling (cents per lb.) . . . . .	6.87 (2)	6.56	6.54	6.63	6.57	6.59	10.64	15.10		10.07	16.17
New York: Middling (cents per lb.) . . . . .	7.05 (2)	6.70	6.65	6.75	6.70 (3)	6.69	10.97	15.41		10.38	16.60
Bombay: M. g. Broach f. g. (rupees per 784 lbs.) . . . .	238	224	220	207	210	207	212	265		191 1/4	283 1/2
Alexandria (a) (talaris per kantar):											
Sakellaridis f. g. f. . . . .	14.02	13.62	13.72	13.42	13.22	13.01	17 3/4	26 1/2		17.12	28 3/4
Ashmouni (Upper Egypt) f. g. f. . . . .	11.85	11.25	11.20	11.00	11.00	10.62	12 1/8	19 1/16		12.00	19 1/8
Bremen: Middling (U. S. cents per lb.) . . . . .	8.17	7.87	7.86	7.82	7.85	7.74	12.07	17.14		11.59	18.27
M. g. Broach fully good (pence per lb.) . . . . .	n. 5.55	n. 5.45	n. 5.45	n. 5.40	n. 5.50	n. 5.55	n. 5.14	n. 6.34	n.	4.63	n. 6.83
Le Havre: Middling, Gulf (francs per 50 kilogr.) . . . .	...	...	...	...	...	...	367	524		349	545
Liverpool (pence per lb.):											
Middling fair . . . . .	n. 6.95	n. 6.50	n. 6.58	n. 6.50	n. 6.52	n. 6.41	n. 7.15	n. 9.86	n.	6.93	n. 10.39
Middling . . . . .	5.95	5.59	5.58	5.50	5.52	5.44	5.95	8.56		5.72	9.09
São Paulo, good fair . . . . .	n. 6.15	n. 5.70	n. 5.78	n. 5.70	n. 5.72	n. 5.63	n. 6.25	n. 8.71		5.91	n. 9.02
M. g. Broach, fully good . . . . .	n. 5.68	n. 5.20	n. 5.30	n. 5.46	n. 5.40	n. 5.31	n. 4.59	n. 6.14	n.	4.25	n. 6.80
Sakellaridis, fully good fair . . . . .	7.70	7.45	7.40	7.35	7.40	7.26	9.60	13.62		9.08	14.52
<b>BUTTER.</b>											
										1931	1930
Copenhagen (a) (Kr. p. 100 kg.) . . . . .	253	228	214	196	190	185	243	290		209	245
Maastricht, auction (b): Dutch (florins p. kg.) . . . .	1.41	1.30	1.18	1.13	1.09	1.14	1.08	2.08		1.38	1.70
Hamburg, auction (b): Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . . . .	142.49	131.42	126.18	113.83	105.14	108.36	154.62	172.03		131.22	146.67
Kempton (b): Allgäu butter (Pfennige p. half kg.) . . . .	3) 130	3) 118	3) 107	3) 100	3) 97	3) 98	126	141		110	128
London (c) (shillings p. cwt.):											
British blended . . . . .	130/8	130/8	130/8	130/8	130/8	133/-	141/2	182/-		140/4	158/8
Danish . . . . .	142/-	130/-	126/-	122/-	126/-	130/-	151/8	177/6		133/4	153/6
Irish creamery, salted . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.		119/3	134/10
Dutch . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	168/-	149/0	182/6		132/1	151/11
Argentine . . . . .	112/-	108/-	108/-	107/-	108/-	108/-	124/-	156/6		117/7	135/10
Siberian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	149/6	(4)	97/4	131/6
Australian, salted . . . . .	110/-	108/-	104/-	102/-	104/-	104/3	122/3	155/-		116/8	135/9
New Zealand, salted . . . . .	113/-	107/-	107/-	106/-	106/-	106/3	125/-	157/-		119/11	137/8
<b>CHEESE.</b>											
Milan (lire per quintal):											
Parmigiano-Reggiano, 1st quality of last year's production . . . . .	975	975	975	975	975	975	1,106	1,137		1,103	1,160
Green Gorgonzola, mature, choice . . . . .	470	470	470	470	495	509	660	747		616	671
Rome: Roman pecorino, choice (lire p. quintal) . . . .	1,162	1,162	1,162	1,162	1,162	1,168	1,081	1,293		1,121	1,207
Alkmaar: Edam 40 + 140% butterfat, with the country's cheesemark, factory cheese, small; florins, p. 50 kg.) . . . . .	20.00	28.00	30.00	30.00	30.00	27.02	35.87	43.25		32.63	40.83
Gouda: Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.) . . . . .	30.50	30.50	31.00	29.50	28.50	28.75	40.00	48.75		37.93	45.50
Kempton (b): (Pfennige per half kg.):											
Softcheese, green (20 % butterfat) . . . . .	17 1/2	17 1/2	17 1/2	17 1/2	21 1/2	20 1/2	23 1/2	24		24	27
Emmenthal from the Allgäu (whole milk cheese) 1st quality . . . . .	83	83	83	83	83	84 1/2	98 1/2 (5)	102 1/2		97 1/2 (5)	97
London (c) (shillings per cwt.):											
English Cheddar . . . . .	118/-	112/-	112/-	110/-	110/-	109/6	97/-	118/-		99/10	103/4
Canadian . . . . .	76/6	75/6	75/-	75/-	78/-	74/-	82/6	103/6		75/9	98/11
New Zealand . . . . .	65/6	64/-	62/-	60/-	60/6	61/1	59/3	92/6		63/2	82/2
Liverpool (c): Engl. Cheshire, ungraded (sh. p. cwt.) . . . .	133/-	133/-	137/8	142/4	142/4	142/4	98/-	130/8		94/8	96/5

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) 11 February. — (3) Quoting system changed: actual prices are generally 3 Pf. higher than according to the ancient system used in Kempton. — (4) Average calculated from the prices for the Fridays and the Thursdays which precede. — Average price for all qualities.

## THE PRICES OF AGRICULTURAL PRODUCTS

### IN JANUARY 1932

In the following pages the index-numbers of prices of agricultural products and other price-indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled "Index-numbers of prices of agricultural products and other price-indices of interest to the farmer". We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilisation from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary tables is given below.

COUNTRIES	Percentage variations in the index-numbers for January, 1932			
	compared with those for December, 1931		compared with those for January, 1931	
	Index-numbers of prices of agricultural products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany . . . . .	— 2.5	— 3.6	— 13.7	— 13.2
England and Wales . . . . .	+ 4.3	— 0.9	— 6.2	— 1.2
Argentina . . . . .	— 4.1	—	— 4.5	—
Canada . . . . .	— 1.9	— 1.3	— 14.0	— 9.5
Estonia . . . . .	—	—	—	—
United States . . . . .	a) — 4.5 b) — 5.2	—	— 33.0 — 28.2	—
Finland . . . . .	0.0	+ 1.5	—	— 12.6
Hungary . . . . .	0.0	+ 2.2	+ 5.4	+ 9.3
Italy . . . . .	+ 2.4	+ 1.0	+ 12.7	+ 7.7
New Zealand . . . . .	— 10.3	+ 0.1	+ 0.8	— 9.9
Netherlands . . . . .	0.0	—	— 12.1	—
Poland . . . . .	— 0.0	—	— 23.9	—
Poland . . . . .	— 9.4	— 3.5	— 9.0	— 10.5
Yugoslavia . . . . .	c) — 2.3 d) + 3.2	+ 0.9	c) — 3.8 d) — 26.2	— 10.4

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

# INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER \*

COUNTRIES AND CLASSIFICATION	Jan. 1932	Dec. 1931	Nov. 1931	Oct. 1931	Sept. 1931	August 1931	Jan. 1931	Jan. 1930	Year	
									1931	1930
<b>GERMANY</b> (Statistisches Reichsamt) 1913 = 100.										
Foodstuffs of vegetable origin . . . . .	115.3	112.8	115.6	112.5	111.7	114.6	111.6	117.2	119.3	115.3
Livestock . . . . .	65.7	68.4	71.4	76.9	84.7	89.0	97.5	127.9	88.0	112.4
Livestock products . . . . .	92.1	101.1	107.4	106.7	108.4	107.9	119.4	133.7	108.4	121.7
Feeding stuffs . . . . .	92.0	93.6	98.7	95.5	96.3	98.3	90.9	98.3	101.9	98.2
Total agricultural products . . . . .	92.1	94.5	98.5	98.5	101.1	108.4	106.7	121.8	103.8	113.1
Fertilizers . . . . .	71.3	70.4	72.1	74.0	73.6	72.8	82.3	85.2	76.5	82.4
Agricultural dead stock . . . . .	122.6	128.3	128.6	129.5	129.7	129.9	134.9	141.0	130.7	139.4
Finished manufactures ("Gebrauchs- güter") . . . . .	126.9	132.4	134.2	135.8	137.8	139.7	147.1	168.4	140.1	168.7
General index-number . . . . .	100.0	103.7	106.6	107.1	108.6	110.2	115.2	132.3	110.9	124.6
<b>ENGLAND AND WALES</b> (Ministry of Agriculture) Average of corresponding months 1911-13 = 100.										
Agricultural products . . . . .	122	117	112	113	120	121	130	148	120	134
Feeding stuffs . . . . .	95	93	97	88	76	77	78	115	83	96
Fertilizers . . . . .	91	91	90	89	88	95	102	102	96	101
General index-number (1). . . . .	90.6	100.5	97.6	96.3	94.9	93.1	100.3	125.4	97.7	114.1
<b>ARGENTINA (2)</b> (Banco de la Nación argentina) 1926 = 100.										
Cereals and linseed . . . . .	55.8	58.2	65.6	63.3	52.7	53.7	53.6	94.3	55.8	82.3
Meat . . . . .	72.2	77.1	84.8	90.8	100.0	97.4	90.6	110.8	91.6	110.9
Hides and skins . . . . .	62.7	59.1	63.3	61.5	53.4	59.3	59.1	79.1	64.5	71.6
Wool . . . . .	49.1	51.7	53.0	80.3	54.3	55.8	50.6	77.4	61.2	67.4
Dairy products . . . . .	53.8	60.6	70.7	74.2	75.3	84.3	68.7	96.0	74.5	82.4
Forest products . . . . .	70.3	80.5	81.7	83.5	89.5	91.6	108.7	111.8	99.3	107.9
Total agricultural products . . . . .	53.9	61.4	63.6	67.7	61.3	62.3	61.7	95.0	63.3	85.5
<b>CANADA (2)</b> (Internal Trade Branch of the Dominion Bureau of Statistics) 1926 = 100.										
Field products (grain, etc.) . . . . .	42.0	42.2	46.0	44.0	41.1	43.0	42.6	91.3	44.6	70.0
Animals and animal products . . . . .	68.8	71.1	72.1	72.1	72.5	74.3	92.1	121.0	77.6	102.9
Total Canadian farm products . . . . .	52.0	53.0	55.8	54.5	52.3	54.7	61.1	102.7	57.0	82.3
Fertilizers . . . . .	71.0	71.1	75.5	75.5	74.3	86.3	88.9	88.5	83.0	88.2
Consumer's goods (other than foodstuffs, etc.) . . . . .	79.8	70.9	79.3	79.9	80.1	79.9	82.9	89.3	80.5	86.3
General index-number . . . . .	69.4	70.3	70.6	70.4	70.0	70.9	76.7	95.3	72.6	86.6
<b>ESTONIA</b> (Central Bureau of Statistics) 1913 = 100.										
Commodities imported . . . . .	...	...	124	127	129	135	128	129	...	118
Commodities exported . . . . .	...	...	70	70	75	78	80	123	...	103
Agricultural products imported and exported . . . . .	...	...	85	86	90	95	93	125	...	106

\* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930), as well as to pages 77 to 79 of the "Crop Report" of January 1932.

(1) Calculated by the "Statist", reduced to base-year 1913 = 100. — (2) Average data for the year 1931 are provisional.

COUNTRIES AND CLASSIFICATION	Jan. 1932	Dec. 1931	Nov. 1931	Oct. 1931	Sept. 1931	August 1931	Jan. 1931	Jan. 1930	Year	
									1931	1930
<b>UNITED STATES (1)</b> (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals . . . . .	52	52	57	46	50	54	77	118	63	100
Fruits and vegetables . . . . .	70	68	68	70	83	97	108	107	98	158
Meat animals . . . . .	68	68	76	79	86	92	112	146	93	134
Dairy products . . . . .	85	92	95	95	92	87	107	135	94	123
Poultry and poultry products . . . . .	87	120	123	110	99	98	110	178	96	126
Cotton and cottonseed . . . . .	45	45	50	42	47	53	72	128	63	102
Total agricultural products . . . . .	63	66	71	68	72	75	94	134	80	117
Commodities purchased by farmers (2) . . . . .	121	123	123	126	127	127	138	154	130	146
Agricultural wages (2) . . . . .	98	—	—	113	—	—	129	150	116	152
<b>UNITED STATES (1)</b> (Bureau of Labor) 1926 = 100.										
Grains . . . . .	46.7	47.0	51.3	44.3	44.2	44.8	62.4	93.8	53.1	53.3
Livestock and poultry . . . . .	53.4	51.7	55.7	57.6	61.0	67.0	75.2	100.5	64.0	89.2
Other farm products . . . . .	54.8	61.2	63.1	64.2	65.4	67.3	76.0	103.0	60.3	91.1
Total farm products . . . . .	52.8	55.7	58.7	58.8	60.5	63.5	73.5	101.0	64.0	88.3
Agricultural implements . . . . .	85.5	92.1	92.1	92.3	94.5	94.5	94.7	96.1	94.0	95.1
Fertilizer materials . . . . .	69.0	70.1	70.1	70.2	74.2	74.4	81.4	89.8	76.8	85.6
Mixed fertilizers . . . . .	75.5	77.1	77.7	77.2	77.6	78.7	80.4	97.1	82.1	93.6
Cattle feed . . . . .	53.0	53.9	59.8	49.4	44.4	50.3	75.0	118.5	62.7	99.7
Non-agricultural commodities . . . . .	70.3	69.3	71.0	71.2	71.7	72.1	78.2	91.4	73.0	85.9
General index-number . . . . .	67.3	66.3	68.3	68.4	69.1	70.2	77.0	93.4	71.2	86.3
<b>FINLAND</b> (Central Bureau of Statistics) 1926 = 100.										
Cereals . . . . .	96	93	81	73	70	76	75	82	77	76
Potatoes . . . . .	68	54	49	49	59	84	68	97	68	76
Fodder . . . . .	73	71	62	53	52	60	50	67	63	62
Meat . . . . .	57	57	51	54	59	64	74	92	64	88
Dairy products . . . . .	90	92	88	77	72	72	73	93	76	84
Total agricultural products . . . . .	78	78	72	67	66	70	74	88	72	82
General index-number . . . . .	94	92	87	82	79	81	80	94	84	90
<b>HUNGARY</b> (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products . . . . .	80	80	89	88	88	88	79	95	—	—
General index-number . . . . .	98	99	99	97	96	92	91	106	—	—
<b>ITALY</b> (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products . . . . .	350.71	342.35	336.84	337.20	334.23	330.21	347.90	464.40	343.11	413.39
General index-number . . . . .	325.92	325.54	328.74	329.85	330.33	331.42	361.86	453.21	341.57	411.04
<b>NEW ZEALAND (1)</b> (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce . . . . .	91.5	91.5	102.6	106.9	102.9	108.7	98.4	135.9	98.9	120.7
Meat . . . . .	122.8	137.8	113.1	119.6	120.7	127.9	147.0	176.2	127.5	164.7
Wool . . . . .	66.8	61.7	66.2	61.6	63.0	68.9	62.3	126.5	66.7	100.7
Hides, skins, and tallow . . . . .	72.1	67.0	67.9	60.0	79.8	82.1	93.2	159.2	81.3	145.4
Miscellaneous . . . . .	112.3	135.8	98.1	122.1	109.8	93.0	113.8	131.5	120.9	134.0
Total agricultural products . . . . .	85.0	94.8	97.8	101.2	99.7	100.5	96.7	139.3	97.4	126.7

(1) Average data for the year 1931 are provisional. — (2) 1910-14 = 100.

COUNTRIES AND CLASSIFICATION	Jan.	Dec.	Nov.	Oct.	Sept.	August	Jan.	Jan.	Year	
	1932	1931	1931	1931	1931	1931	1931	1930	1931	1930
<b>NORWAY</b> (Kgl. Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals . . . . .	123	110	110	106	111	112	102	142	(1) 114	(1) 155
Potatoes . . . . .	137	126	119	109	97	170	180	110	(1) 152	(1) 120
Pork . . . . .	95	90	88	92	86	91	89	140	(1) 98	(1) 141
Other meat . . . . .	113	126	121	127	137	153	184	200	(1) 198	(1) 199
Eggs . . . . .	90	114	122	126	117	87	107	128	(1) 121	(1) 135
Dairy products . . . . .	129	136	133	131	127	126	139	165	(1) 150	(1) 161
Concentrated feeding stuffs . . . . .	109	108	102	97	97	102	107	141	(1) 117	(1) 148
Maize . . . . .	86	85	81	73	71	79	89	133	(1) 103	(1) 148
Fertilizers . . . . .	91	86	86	81	81	85	96	106	(1) 101	(1) 103
<b>NETHERLANDS</b> (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil . . . . .	58	57	59	58	57	61	62	61	(2) 67	(2) 68
Animal products . . . . .	53	53	57	58	64	68	74	94	(2) 77	(2) 95
Total agricultural products . . . . .	54	54	58	58	62	67	71	86	(2) 75	(2) 88
Agricultural wages . . . . .	95	95	95	95	95	95	100	100	(2) 99	(2) 100
General index-number (3) . . . . .	...	57.4	60.2	60.2	61.6	63.7	71.0	88.6	65.7	79.2
<b>POLAND (4)</b> (Central Bureau of Statistics) 1927 = 100.										
Products of the soil . . . . .	52.7	58.0	59.1	51.0	46.6	47.7	44.3	57.0	53.9	52.1
Products of agricultural industry . . . . .	62.6	66.2	68.7	61.3	60.1	62.1	59.3	73.6	65.9	69.9
Total products of plant origin . . . . .	57.8	62.4	64.2	56.6	53.3	54.8	51.5	64.8	60.0	60.5
Animals . . . . .	37.5	41.3	43.7	47.5	59.3	66.2	54.9	91.9	55.8	82.4
Dairy products . . . . .	56.9	68.0	76.9	66.3	63.3	61.2	83.1	91.6	68.0	81.5
Total products of animal origin . . . . .	45.4	51.8	56.4	55.3	61.3	64.2	66.2	91.3	60.8	81.9
Total agricultural products . . . . .	51.8	57.2	60.3	55.6	56.2	58.3	56.9	74.8	59.7	68.5
Fertilizers . . . . .	108.4	108.4	118.5	118.5	118.5	118.5	124.7	130.6	120.2	127.8
Industrial products . . . . .	74.7	74.0	74.5	75.3	76.0	77.8	84.1	99.1	79.4	94.0
General index-number . . . . .	64.1	66.4	68.2	66.3	67.0	69.0	71.6	88.2	70.5	82.3
<b>YUGOSLAVIA</b> (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil . . . . .	69.0	70.6	70.9	71.1	70.4	75.7	71.7	104.5	74.3	89.3
Animal products . . . . .	60.5	58.6	63.6	66.1	70.1	75.6	82.0	98.2	72.2	96.3
Industrial products . . . . .	69.2	68.5	68.7	69.3	72.2	70.8	72.8	86.6	71.4	81.8
General index-number . . . . .	67.3	67.2	68.6	69.5	71.6	73.6	75.7	98.6	72.9	86.6

(1) Agricultural year April 1-March 31. — (2) Agricultural year July 1-June 30. — (3) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100. — (4) Average data for the year 1931 are provisional.

## RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	Feb.	Feb.	Feb.	Jan.	Jan.	Average				Commercial Season	
	19,	12,	5,	29,	22,	Jan.	Feb.	Feb.			
	1932	1932	1932	1932	1932	1932	1931	1930			
SHIPMENTS OF WHEAT AND MAIZE.											
Danube to Antwerp/Hamburg . . . . .	n. q.	n. q.	14/4½	n. q.	n. q.	n. q.	n. 14/1½	n. q.	13/11	15/8	
Black Sea to Antwerp/Hamburg . . . . .	11/-	11/-	11/1½	11/3	11/3	11/3	11/-	n. q.	10/10	n. q.	
St. John to Liverpool (1) . . . . .	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/4	1/6	1/5	
Montreal to United Kingdom . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1/10	1/10	
Gulf to United Kingdom . . . . .	1) 2) 0.12	1) 2) 0.12	1) 2) 0.12	1) 2/3	1) 2/3	1) 2/3	1) 1/9½	2/3	2/3	2/6	
New York to Liverpool (1) . . . . .	2/-	2/-	1/6	1/6	1/6	1/6	1/6	1/4	1/6	1/6	
Northern Range to U.K. and Continent . . . . .	n. q.	n. q.	2) 0.13	n. q.	n. q.	n. q.	n. 1/7½	2/-	1/9	1/9	
North Pacific to United Kingdom (sh. per 2240 lbs.) . . . . .	24/6	23/-	21/3	21/-	n. q.	n. 22/8	n. 22/6	18/4	22/3	22/7	
Vancouver to Yokohama (1) (gold \$ per sh. ton) . . . . .	2.50	2.50	2.75	2.45	2.45	2.45	2.75	2.56	2.72	2.78	
La Plata Down River (3) to U. K./Continent . . . . .	17/6	17/6	17/3	17/-	17/-	17/1	18/-	10/5	16/4	12/8	
La Plata Up River (4) to U. K./Continent . . . . .	19/-	18/9	18/9	18/3	18/6	18/3	19/7½	11/10	18/-	14/4	
Karachi to U. K./Continent (5) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	19/9	n. q.	19/3	n. 15/4	
Western Australia to U.K./Continent . . . . .	28/6	27/3	25/6	26/6	27/0	27/7	30/-	21/7	29/8	25/7	
SHIPMENTS OF RICE.											
Saigon to Europe . . . . .	x) 22/6	6) 100	n. q.	x) n. 25/-	x) n. 25/-	(1) 25/1	(x) 25/-	n. 23/-	24/3	n. 18/11	
Burma to U.K./Continent . . . . .	n. 25/-	n. 22/6	n. 23/-	23/6	25/6	25/4	n. 23/4	18/-	23/9	n. 17/8	

(1) Rates for parcels by liners. — (2) Freight in gold \$ per 100 lbs. — (3) "Down River", includes the ports Buenos Aires and La Plata. — (4) "Up River" includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight. — (5) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs. — (6) Freights in French francs per 2,240 lbs.

## EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (-) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	February 19, 1932	February 12, 1932	February 5, 1932	January 29, 1932	January 22, 1932
Germany . . . . .	Berlin	—	0.4	—	0.4	—
Argentina . . . . .	New York	—	39.3	—	39.3	—
Belgium . . . . .	Brussels	+	0.4	+	0.3	+
Canada . . . . .	New York	—	12.4	—	13.0	—
Denmark . . . . .	Copenhagen (2)	—	29.3	—	29.2	—
Egypt . . . . .	London (3)	—	29.1	—	29.0	—
France . . . . .	Paris	+	0.6	+	0.5	+
Great Britain . . . . .	London (3)	—	29.1	—	29.0	—
Hungary . . . . .	Budapest	—	0.0	—	0.0	—
India . . . . .	London	—	28.5	—	28.4	—
Indo-China . . . . .	Paris	+	0.6	+	0.5	+
Italy . . . . .	Milan	—	1.1	—	1.0	—
Japan . . . . .	New York	—	32.8	—	29.1	—
Netherlands . . . . .	Amsterdam	+	0.5	+	0.2	+
Rumania . . . . .	New York	—	0.2	—	0.4	—

(1) The percentage represents the premium or the loss as far as possible on the national exchange. On page 164 may be found the table of reciprocal parities of the currencies considered; by the aid of this table and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Crop Report refer. — (2) 13 Nov. 1931: — 19.9; 6 Nov.: — 19.1; 30 Oct.: — 18.7; 23 Oct.: — 18.3. — (3) 13 Nov.: — 22.4; 6 Nov.: — 22.3; 30 Oct.: — 24.3; 23 Oct.: — 19.6.

## IMPORT DUTIES ON CEREALS AND FLOUR

### CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGES 160 TO 163 OF THIS CROP REPORT

(SEE ALSO PAGE 79 OF THE CROP REPORT FOR JANUARY).

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Austria	Wheat (supplementary duty)	12 February	gold crs. 5.00	27.57
"	Rye	"	" 2.00	10.29
"	Wheat Flour	"	" 10.00	180.07
"	Rye Flour	"	" 4.00	72.04
France	Yellow maize, small grain, Bessarabian type, for feed	1 February	Fr. frs. 14.40	14.31
Poland	Wheat (manipulation tax)	15 January	Zloty 5.00	15.23
"	Rye	"	" 3.40	9.70
"	Barley	"	" 3.40	8.32
"	Oats	"	" 3.40	5.55
"	Maize	"	" 1.20	3.43
"	Wheat flour	"	" 7.40	73.76
"	Rye flour	"	" 5.00	49.75
Czechoslovakia	Rye (supplementary duty)	10 February	Cz. crs. 16.00	12.06
"	Oats	"	" 34.00	14.68

(1) In the case of the importation of horsetooth maize without payment of customs duty, manipulation tax zl. 0.60 (1.72 \$c. per bushel).

### REMARK

#### IMPORT DUTIES FOR CEREALS AND FLOUR IN FORCE IN EUROPE ON 1<sup>ST</sup> JANUARY 1932

*Owing to certain modifications received only after the publication of the January "Crop Report" the tables of import duties for cereals and flour in force in Europe on 1 January 1932 are republished on the following pages. This table replaces that on pages 66 to 69 of the January "Crop Report".*

## IMPORT DUTIES ON CEREALS AND FLOUR, AS

Duties expressed in the official currency of the respective countries per metric quintal (a)  
and in U. S. A. \$ cents per bushel or barrel (U. S. measures) (b).

(M = imports exclusively by the Monopoly).

[illegible]



RULING IN EUROPE ON JANUARY 1<sup>st</sup> 1932 (*see over*).

GENERAL NOTE: The duties indicated are those generally applied. Reductions into dollars have been made, for countries that on 1st January maintained the gold standard, according to the legal parity (see table on page 164), for other countries according to the exchange rates (see table on page 158) or according to the special rules established for that purpose (see the notes below). In subsequent numbers of the Crop Report all known modifications will be regularly given. (See also page 79 and 159).

WHEAT FLOUR		RYE FLOUR		NOTES	COUNTRY
a	b	a	b		
37.50	643.28	12.00	205.85	a) indicates basic duty; b) supplementary duty (equivalent to 13 % of basic duty).	Albania
4.57	78.40	1.56	26.76		
43.17	914.23	43.17	914.23		
				(1) In addition <i>ad valorem</i> turnover taxes of 0.85 % on cost including import duty. — (2) General duty. — (3) Wheat imported under customs control for the manufacture of wheat starch, as well as hard wheat imported under customs control by mills manufacturing hard wheat groats in 1931 before 1 October, for the manufacture of groats. — (4) In cases where an export certificate (Ausfuhrschein) showing the export of a corresponding quantity of the same cereal during the period ending 31 December 1931 is produced; duty valid until 31 July 1932. — (5) Barley imported under customs control for stock feeding. — (6) As under note 5; in cases of controlled purchase of certain quantities of potato flakes or home grown barley.	Germany
15.50	279.10	15.50	279.10	a) indicates basic duty; b) supplementary duty. — (1) In addition <i>ad valorem</i> taxes (on cost including import duty): 2 % for whole cereals, 7 % for flours. — (2) General duty. — (3) Barley for stock feeding, recognised as such.	Austria (1)
8.00	144.06	8.00	144.06		
(2) 4.00	(2) 9.95	(3) 4.00	(3) 9.95	(1) In addition <i>ad valorem</i> turnover taxes: 4 % for oats and maize; 2 % for all other cereals and flour mentioned. — (2) Import and transit are conditional on special ministerial authorisation. — (3) Import and transit of these products, when originating in or coming from the U. S. S. R., are conditional on special ministerial authorisation.	Belgium (1)
324	208.08	324	208.08	a) indicates import duty; b) total of taxes, etc. levied on import.	Bulgaria
105	67.42	105	67.42		
—	—	—	—	—	Denmark
(2) 21.00	n. 360.24 (2)	9.00	n. 154.39	(1) 25 % of each duty is levied in gold pesetas, 75 % in paper pesetas with a supplement fixed every 10 days. — (2) Import forbidden until price of wheat on the markets of Castile is 53 pesetas per quintal (120.39 \$ c. per bushel).	Spain
(4) 18.00 (5) 29.00	(4) 423.02 (5) 681.54	5.00	117.51	(1) All these products are controlled by a monopoly and their import is permitted only on presentation of an import permit and of a certificate or other proof of origin. — (2) General duty; Estonian mills have the right to import free of duty 145 kg. of wheat for each 100 kg. of bolted wheat flour exported, on condition that they import it within a year's time from the export of the wheat flour. — (3) Special duty on imports from Lithuania. — (4) Unbolted flour. — (5) Bolted flour.	Estonia (1)
—	—	—	—	(1) Duty per cwt.	Irish Free State
(1) 150 (2) 250	(1) 337.08 (2) 561.80	(1) 145 (2) 225	(1) 325.76 (2) 505.54	(1) Unbolted flour. — (2) Bolted flour.	Finland
(5) 128.00 (6) 180.00 (7) 185.00	(5) 445.84 (6) 557.34 (7) 644.31	70.00	243.76	(1) In addition, for all the products mentioned, except maize, there is a supplementary <i>ad valorem</i> duty on imports from countries of devaloured currency: 7 % for India, 8 % for Norway, 10 % for Argentina and Uruguay, 15 % for Australia, Denmark, Great Britain, Mexico and Sweden. — (2) All imports of foreign wheat are subject to the presentation to the customs authorities of a nominal and non-transferable import licence, stating the quantity for which it is valid; these conditions do not apply to denatured wheat, not usable for human consumption. — (3) Yellow maize, small grain, Bessarabian type, for feed. — (4) Other maize. — (5) For coefficient of extraction of 70 % and over. — (6) For coefficient of extraction of under 70 % and over 60 %. — (7) For coefficient of extraction of 60 % and under.	France
—	—	—	—	—	Great Britain and Northern Ireland

## IMPORT DUTIES ON CEREALS AND FLOUR, AS

COUNTRY	OFFICIAL CURRENCY	WHEAT		RYE		BARLEY		OATS		MAIZE	
		a	b	a	b	a	b	a	b	a	b
Greece a) . . . .	gold drachmas	6.00	31.51	5.00	24.51	5.00	21.00	5.00	14.00	(1) 5.00 (2) 6.00 (3) 3.00	(1) 24.51 (2) 20.41 (3) 14.70
b) . . . .	"	4.50	23.63	3.75	18.38	3.75	15.75	3.75	10.50	(1) 3.75 (2) 4.50 (3) 2.25	(1) 18.38 (2) 22.08 (3) 11.03
Hungary . . . .	gold crowns	(1) 6.30	(1) 34.76	(1) 5.80	(1) 29.85	(1) 5.00	(1) 22.06	(1) 4.80	(1) 14.12	(2) 2.00	(2) 10.29
Italy a) . . . . .	liras	75.00	107.44	36.50	48.82	14.70	16.85	11.95	9.13	(1) 75.00 (2) 5.00 (3) 30.00	(1) 100.28 (2) 6.68 (3) 40.09
b) . . . . .	"	—	—	2.50	3.34	(4) 2.50	(4) 2.80	2.50	1.91	(4) 2.50	(4) 3.84
Latvia (1) . . . .	lats	(2) 7.00 (3) 5.60 (4) 1.75	(2) 36.76 (3) 29.41 (4) 9.19	—	—	(5) 12.00	(5) 50.41	(5) 12.00	(5) 33.61	—	—
Lithuania . . . .	litas	30.00	81.61	20.00	50.78	20.00	43.52	20.00	20.02	20.00	50.78
Norway . . . .	—	M	M	—	—	M	M	M	M	—	—
Netherlands . . .	—	(1) —	(1) —	—	—	—	—	—	—	—	—
Poland (1) a) . .	zlotys	25.00	76.30	17.00	48.42	17.00	41.51	17.00	27.67	(2) 6.60	(2) 17.11
b) . .	"	2.50	7.63	1.70	4.84	1.70	4.15	1.70	2.77	(3) 0.60	(3) 1.71
Portugal . . . .	escudos (1)	(2) 80.00	(2) 68.37	(2) 29.34	(2) 23.88	48.90	38.44	48.90	22.29	36.67	20.26
Rumania . . . .	lei	160	28.05	45	6.86	40	5.21	36	8.14	26	5.49
Sweden . . . . .	Swed. crowns	(1) 3.70	(1) 19.17	(1) 3.70	(1) 17.89	3.70	15.33	—	—	—	—
Switzerland . . .	Swiss. francs	0.60	3.15	0.60	2.94	(1) 9.45 (2) 0.60	(1) 39.70 (2) 2.52	0.60	1.68	0.50	2.45
Czechoslov. a) . .	Czech. crowns	30.00	24.21	38.00	28.62	34.00	21.93	36.00	15.49	(2) 18.00 (3) 6.00	(2) 13.53 (3) 4.51
b) . .	"	25.00	20.17	15.00	11.27	36.00	23.23	30.00	12.91	—	—
c) (1) .	"	4.00	3.23	4.00	3.00	4.00	2.58	4.00	1.72	4.00	3.01
Yugoslavia . . .	gold dinars	(1) 5.00	(1) 26.26	(1) 5.00	(1) 24.51	6.00	25.21	3.00	8.40	2.50	12.25

RULING IN EUROPE ON JANUARY 1<sup>st</sup> 1932 (*end*).

WHEAT FLOUR		RYE FLOUR		NOTES	COUNTRY
a	b	a	b		
10.70	183.55	(4) 10.00 (5) 12.00	(4) 171.54 (5) 205.85	a) indicates import duty; b) surtax. — (1) Yellow maize. — (2) White maize. — (3) Pignoletto cinquantino. — (4) Flour in bag. — (5) Flour in boxes, etc.	Greece
8.02	137.58	(4) 7.50 (5) 9.00	(4) 128.06 (5) 154.39		
13.00	234.16	12.00	216.14	(1) Cereals for sowing, with special authorisation, free. — (2) Maize for sowing, free.	Hungary
112.35	525.78	50.90	238.10	a) indicates import duty; b) trade taxes. — (1) White maize. — (2) Maize other than white maize, not fit for consumption and destined for industrial use. — (3) Other maize. — (4) Barley and maize for industrial use.	Italy
—	—	—	—		
(6) 10.00 (7) 25.00	(6) 171.54 (7) 428.86	(8) 5.00 (9) 12.00	(8) 85.77 (9) 205.85	(1) The import of wheat and of rye, as well as that of flour manufactured from these cereals, is allowed only on presentation of a certificate indicating the purchase of certain quantities of the same cereals of domestic origin. — (2) General minimum duty. — (3) Special duty, for imports from U. S. S. R. — (4) Special duty applying to 50,000 quintals (183,715 bushels) per annum, imported from Lithuania. — (5) During 1932 the import of barley and of oats is limited to 5,000 quintals each (22,965 bush. of barley and 34,447 bush. of oats). — (6) Unbolted flour. — (7) Bolted flour. — (8) Flour roughly ground. — (9) Flour at least partly bolted.	Latvia
90.00	799.73	55.00	488.72	—	Lithuania
M	M	M	M	—	Norway
(2) —	(2) —	—	—	(1) To cover the expenses of the Organisation for the purchase of home grown wheat at a special price, importers of wheat pay a certain amount per quintal. — (2) The trade in imported flour is regulated by the Central Flour Organisation.	Netherlands
37.00	368.99	25.00	249.25	a) indicates import duty; b) manipulation taxes. — (1) The import of the products enumerated is prohibited during 1932, save in January and February 1932 with special licence for that of 10% of the quantity of the same cereals imported in the first quarter of 1932. — (2) Import of horsetooth maize with special licence is possible without payment of customs duty. — (3) In case of import without payment of duty 21 0.30 per quintal (0.85 \$c. per bushel).	Poland
3.70	36.90	2.50	24.92		
(2)	(2)	(2)	(2)	(1) According to the law of 9 June 1931 the gold escudo is equivalent to 24.45 escudos of the national currency. — (2) Special legislation, according to which import is limited to cereals for certain uses and to quantities fixed each year in relation to the needs to be covered after the harvest. For the time being there is authorised only the import of a small quantity of wheat.	Portugal
400	212.71	400	212.71	—	Rumania
(1) 6.50	(1) 110.18	(1) 6.50	(1) 110.18	(1) Import of these products is permitted only according to the regulations prescribed by the Monopoly.	Sweden
(3) 4.50	(3) 77.19	(3) 4.50	(3) 77.19	(1) Brewer's barley. — (2) Barley, other. — (3) Flour suitable for bread-making may be imported only under official authorisation and on payment of a supplementary duty of 20.00 Swiss frs. per quintal (343.08 \$c. per barrel).	Switzerland
70.00	184.41	70.00	184.41	a) indicates basic duties; b) supplementary duties; c) trade taxes and payments for authorisation of import. — (1) A special duty of 1% <i>ad valorem</i> (not including import duty) is also levied for the authorisation of import. — (2) Maize for feed. — (3) Other maize.	Czechoslovakia
52.00	187.06	52.00	187.06		
18.00	84.29	18.00	84.29		
(1) 8.00	(1) 137.28	(1) 8.00	(1) 137.28	(1) Import of these products is permitted only under control of the Monopoly.	Yugoslavia

RECIPROCAL PARITIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN  
THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	Canada United States	Denmark	Egypt	France Indo China	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Rumania	Czechoslovakia	Former Latin monetary union (3)
Germany	Reichsmark	1	0.561	8.566	0.238	0.889	4.819	0.080	0.979	1.362	0.663	4.526	0.478	0.598	2.123	30.825	8.040	1.285
Argentina	Paper peso	1.782	1	15.263	0.424	1.584	8.586	10.833	1.744	2.427	1.168	8.064	0.851	1.056	8.872	70.969	14.326	2.200
Belgium	Franc	0.117	0.065	1	0.028	0.104	0.568	0.710	0.114	0.159	0.076	0.528	0.056	0.069	0.248	4.049	0.939	0.145
Canada United States	Dollar	4.198	2.856	35.959	1	3.731	20.230	25.524	4.110	5.718	2.740	19.000	2.006	2.488	8.914	107.181	33.751	5.183
Denmark	Crown	1.125	0.631	9.637	0.268	1	5.422	6.840	1.101	1.532	0.734	5.092	0.583	0.667	2.380	44.803	9.045	1.389
Sweden																		
Egypt	Piastre	0.207	0.016	1.777	0.049	0.184	1	1.292	0.203	0.283	0.135	0.939	0.090	0.123	0.441	8.204	1.668	0.256
France	Franc	0.164	0.092	1.409	0.039	0.146	0.793	1	0.161	0.224	0.107	0.744	0.079	0.097	0.349	6.550	1.322	0.203
Indo-China	Piastre (2)																	
Great Britain	Shilling	1.021	0.573	8.750	0.243	0.998	4.923	6.211	1	1.391	0.667	4.623	0.488	0.605	2.169	40.680	8.213	1.261
Hungary	Pengo	0.734	0.412	6.239	0.175	0.653	3.530	4.464	0.720	1	0.479	3.323	0.351	0.435	1.559	29.240	5.903	0.906
India	Rupce	1.532	0.860	13.125	0.305	1.362	7.384	9.316	1.500	2.087	1	6.935	0.732	0.908	3.254	61.020	12.319	1.892
Italy	Lira	0.221	0.124	1.892	0.053	0.196	1.065	1.343	0.216	0.301	0.144	1	0.106	0.131	0.469	8.769	1.776	0.273
Japan	Yen	2.092	1.174	17.924	0.498	1.860	10.054	12.723	2.049	2.850	1.399	9.471	1	1.240	4.443	83.333	16.324	2.583
Netherlands	Florin	1.687	0.947	14.454	0.402	1.450	8.132	10.260	1.652	2.298	1.101	7.637	0.306	1	3.583	67.200	13.567	2.083
Poland	Zloty	0.471	0.264	4.034	0.112	0.419	2.269	2.363	0.461	0.641	0.307	2.131	0.225	0.279	1	13.755	3.736	0.531
Rumania	Leu	0.025	0.014	0.215	0.006	0.022	0.121	0.153	0.025	0.034	0.016	0.114	0.012	0.015	0.053	1	0.202	0.031
Czechoslovakia	Crown	0.124	0.070	1.065	0.030	0.111	0.599	0.756	0.122	0.169	0.081	0.563	0.059	0.074	0.264	4.953	1	0.154
Former Latin monetary union (3)	Gold Franc	0.310	0.455	6.938	0.193	0.720	3.903	4.925	0.793	1.103	0.529	3.666	0.387	0.430	1.720	32.258	6.512	1

(1) Head figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) Gold piastre equal to 10 francs. — (3) Data for purpose of comparison.

# MONTHLY CROP REPORT

## AND AGRICULTURAL STATISTICS

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*At this period of the year many Governments suspend their monthly crop condition reports until next spring when they again commence.*

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*The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.*

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### WORLD SUPPLIES AND REQUIREMENTS OF WHEAT

In the Crop Report of last October it was estimated, on the basis of the provisional data then available, that world wheat production in the current year was considerably below the requirements of consumption and that consequently the wheat stocks as on 1 August 1931, which amounted, to a total of 550 million bushels, reaching a record quantity, should have been greatly reduced during the current season to not more than 360 million bushels on 1 August, 1932, a quantity still above the normal, but no longer weighing excessively on the market.

Now that more exact and complete estimates are available of the crops of the two hemispheres and also data of the movement of the wheat trade during the first half of the present season, a new examination may be made of the situation of wheat supplies and requirements in order to determine whether the estimates formulated last October should now be modified and if so, to what extent.

#### WORLD WHEAT PRODUCTION.

The preliminary data published last October indicated a decrease of about 170 million bushels in world wheat production in 1931 compared with 1930 without taking into account the decrease in the U.S.S.R. for which the 1931 production figures are not yet known. The revisions made since October have, in almost all cases, increased, sometimes considerably, the preliminary estimates so that the world crop no longer shows the large deficit of about 170 million bushels which was at first noted in comparison with 1930. The following table, in which are grouped, by continents the totals of wheat production for the last six years, including practically all the producing countries (except the U.S.S.R. and a large part of China) shows that production in 1931 is smaller by only 74 million bushels than that of 1930. This improvement in crop results took place principally in Europe, the total for which has increased by 40 million bushels on the October estimate, in North America whose total has likewise increased by 43 million bushels and, to a smaller extent, in the two countries of the southern hemisphere.

*World Wheat production*  
(in million bushels).

	1931	1930	1929	1928	1927	1926
Europe . . . . .	1,440	1,367	1,451	1,411	1,275	1,216
North and Central America . .	1,213	1,290	1,124	1,492	1,371	1,249
South America . . . . .	276	279	224	404	342	276
Asia (1) . . . . .	562	603	540	459	503	496
Africa . . . . .	132	118	136	118	118	110
Oceania . . . . .	180	220	136	169	129	169
Total . . . . .	3,803	3,877	3,611	4,053	3,738	3,516
U.S.S.R. . . . .	...	1,084	702	794	786	915

The 1931 world wheat crop, as estimated at present and excluding that of the U.S.S.R. and the larger part of that of China due to the lack of data, can no longer be considered to be a poor or deficient crop as it was judged to be on the basis of the preliminary estimates, but rather an average or even a good average crop. It is, in fact larger by about 44 million bushels than the average of the five years 1926-1930. The 1931 production was very abundant in Europe and in Africa, having nearly reached in these two continents the maximum of 1929, and fairly good in the southern hemisphere and in Asia; it was rather poor only in North America.

The production of the U.S.S.R. of which an exact estimate is still lacking, does not appear to have been abundant but it can no longer be considered to have been completely bad as it gave rise to fairly considerable exports.

#### SUPPLIES OF WHEAT FOR EXPORT.

The modifications made since October in the production estimates were mostly for the exporting countries, with the result that the calculations of exportable supplies have for this reason been considerably changed.

*North America.* — The total estimate of North American production is slightly above that of last October, both the United States and Canada having increased their preliminary estimates. The combined crop of these two countries is estimated at 1,196 million bushels showing an increase of 41 millions over the previous figure. As regards home consumption a total was calculated last October for the two countries of 830 million bushels. Official estimates are now available of probable consumption in the season 1931-32 for both the United States and Canada. The Department of Agriculture at Washington on February 20 calculated it at 708 million bushels for the United States and the estimate made at Ottawa for Canada on February 18 was 120 millions, the total of these two official estimates therefore corresponding closely to the estimate published in the Institute's October Crop Report. The quantities exportable from North America amounted last October to 275 million bushels for Canada and 460 millions for the United States, that is, a total of 735 millions; now that the production estimates have increased, these quantities are raised to 310 millions for Canada and 470 millions for the United States, the new total being 780 millions. These figures do not include 70 million bushels the minimum carry-over at the end of the season. Of this exportable surplus there was exported in the:

(1) Including the various countries of Asia Minor and Manchuria.

first six months of the season, according to the official trade figure, 117 million bushels from Canada and 64 millions from the United States making a total of 181 millions. This total, however, does not represent the actual export from the two countries taken together, as part of the quantity declared for export has, in fact, only crossed the frontier and remained in bond in the neighbouring country. The total consequently includes quantities which have not really left North America. In fact, the stocks of wheat of Canadian origin deposited in warehouses in the United States have increased, from August 1, 1931 to January 31, 1932, by 16 million bushels, and those of wheat originating in the United States and bonded in Canada, by 6 millions. Consequently, in order to calculate the actual export of each of the two countries, account must be taken of the quantity remaining in the territory of the other by deducting it from the customs figures. Exports in the first half of the season are therefore calculated at 101 million bushels for Canada and 58 millions for the United States, giving a total of 159 millions. This method of calculation, which has until now been followed in the Crop Report, is not completely perfect but gives rise to only the least error; this opinion is shared by the United States Department of Agriculture in its recent revue of the world wheat outlook dated February 20. It must also be taken into account that the official statistics of commercial movement of wheat from Canada and the United States present *lacunae*, certain quantities passing from one country to the other being possibly exported without appearing in the exports of the country of origin. If it is desired to take into account this under-estimation on the part of the official statistics it is necessary to add about 10 million bushels to the 159 millions above-indicated; thus a total export from North America of about 170 million bushels would be reached. Separating this quantity from the total surplus of North America, calculated at 780 million bushels, the exportable supplies on 1 February 1932 would be 610 millions, nearly 205 millions for Canada and 405 millions for the United States.

*Argentina*. — The official estimates of production not yet being available in October, account was taken in calculating the exportable surplus of a crop amounting approximately to 220 million bushels. The estimate of the Argentine Government published in November gave a figure of 218.6 million bushels, which has recently been revised and raised to 226.0 millions. Stocks of old crop existing on 1 January 1932 have been officially estimated at 16 million bushels; adding the 32 millions exported in the five months from 1 August to 31 December 1931 a total is obtained of almost 48 million bushels of old crop wheat existing on 1 August 1931. The total supplies of Argentina this season amount therefore to 274 million bushels and the quantity exportable, allowing for internal consumption of about 95 millions, amounts to 180 million bushels for the season, an estimate approaching very closely to the 190 millions published last October. Of these 180 millions there were exported during the first six months of the season nearly 44 millions, so that the exportable supplies of Argentine wheat on 1 February 1932 may be estimated at 136 million bushels.

*Australia*. — The crop in this country is at present estimated at 175 million bushels, a figure very much above that which there was reason to give before the harvest. Stocks of old crop wheat existing in the country on 1 August, estimated at 33 million bushels have also proved to have been underestimated, since the exports of August-November rose to 32.3 million bushels and the remainder on 1 December was 13.5 millions, which means a total surplus of old crop on 1 August of 46 million bushels. The total supplies of Australian wheat for 1931-32 rise therefore to 221 million bushels; taking account of an internal consumption of 55 millions the exportable supplies of Australia this season amount to 166 million bushels, an increase of 36 millions on the forecasts made in October.

The actual exports of Australia in the first six months of the season were 61 millions so that on 1 February 1932 there was still in the country an exportable surplus of about 105 million bushels.

*U.S.S.R.* — The available information on the U.S.S.R. remains nearly the same as that of last October. It appears to be confirmed that the winter wheat crop has been large and that that of spring wheat rather small but the estimate of production has not yet been published. The heavy exports of Russian wheat that took place in August and September did not lead us, in our October estimate, to foresee an exportable surplus as great as that of last season. We considered, on the contrary, that the exports of Russian wheat would fall off very quickly and that they would attain about 75 million bushels in all, remaining therefore considerably below the 110 millions shipped in 1930-31. It seems that this expectation has been entirely fulfilled, since the exports of the U.S.S.R. have gradually declined to insignificant amounts, attaining in the six months from August to January a total of 68 million bushels. Consequently we maintain the estimate of the surplus of the U.S.S.R. at 75 million bushels.

*British India.* — As was forecast in October, British India continued to be absent from the world market as a supplier of wheat. The new crop about to be harvested appears, despite increase in area cultivated, to be nearly the same as that of last year in consequence of the drought in the first months of the year; so that it does not seem probable that India can reassume a role of any importance in the current season.

*Danubian countries.* — The European exporting countries that, according to the provisional estimates available in October indicated a production of some million bushels below that of 1930, have all greatly raised their estimates so that their production increases from 345 to 367 million bushels and instead of being inferior to that of 1930, exceeds it by 15 million bushels. It was estimated in October that despite the mediocre production indicated by the preliminary figures, these Danubian countries would be able to export about 55 million bushels of wheat, a figure higher than that of the previous year, owing to the excellent production of maize, which, by replacing wheat in internal consumption, would leave available for export quantities of the latter greater than usual. But production of wheat has proved much greater than was expected and the quantities exportable from Danubian countries are increased in consequence; we estimate the total at 82 million bushels. Since, of this quantity, there had been already exported in the six months from August to January about 66 millions, the exportable surplus existing on 1 February 1932 in the Danubian countries as a whole may be estimated at about 16 million bushels.

*North Africa.* — Of the quantities exportable, estimated at 20 million bushels, there should have been exported by the end of January about the half. The remainder will probably be supplied as usual, by the shipments in June and July from the new crop.

*World supplies available for export.* — Summarising, the exportable supplies of wheat in the various surplus-producing countries and the quantities afloat at the beginning and at the middle of this season, of which the totals represent the quantities available to meet the demands of the importing countries, amount to 1,338 million bushels, an increase of 98 millions on the forecast of October, due to the more favourable results of the harvest in the majority of exporting countries. This surplus, though very considerable, still remains nevertheless 12 million bushels below that of last season and 82 millions below the maximum recorded in 1928-29.



*World Exportable Supplies of Wheat  
at the beginning and the middle of the 1931-32 season.*

	Total exportable surpluses and quantities afloat		Exports from Exportable surpluses on	
	Forecast October 1931	Estimate March 1932	1 Aug. 1931 to 31 Jan. 1932	1 February 1932
	(million bushels)			
Canada . . . . .	275	310	105	205
United States . . . . .	460	470	65	405
Argentina . . . . .	190	180	44	136
Australia . . . . .	130	166	61	105
U.S.S.R. . . . .	75	75	68	7
British India . . . . .	0	0	0	0
Danubian countries . . . . .	55	82	66	16
North Africa . . . . .	20	20	12	8
Quantities afloat . . . . .	35	35	—	51
Totals. . . . .	1,240	1,338	(1) 405	933

REQUIREMENTS OF IMPORTING COUNTRIES.

*Europe* : It was estimated in October that in consequence of their poor rye crop and the low level of current prices the European wheat importing countries would take a larger quantity than in the previous year ; to cover the difference between their internal production and their probable consumption they would, it was estimated, have to import about 640 million bushels of wheat in place of the 606 millions imported in 1930-31. Since then their wheat production has proved to be larger than the preliminary estimates indicated, being in fact about 16 millions above the previous estimate ; for rye the estimate of production has remained practically unchanged. Assuming that our October estimate of total European consumption was well founded the probable import requirements must be reduced by an amount corresponding to the increase in the estimate of production. Our estimate of the quantity to be imported into Europe this season is therefore reduced from 640 to 624 million bushels. In addition as the following table shows, the development of imports was such that the quantities entering Europe in the six months from August to January were rather small. A general increase in European demand in the coming months must, therefore, be expected, though not to any extremely great extent since increases in the quotas for home-grown wheat from the commencement of the crop must be expected in several countries, with consequent restriction on purchases of foreign wheat in the last weeks of the season as importers will not wish to accumulate stocks of such wheat, which would be difficult to move for some months. In the following table are indicated the probable wheat requirements of the different European countries for the entire season, the quantities imported in the first half of the season and the balance to be imported in the second half. This calculation of the probable requirements of each country can only be considered as provisional and the conclusions are consequently subject to possibly important modifications. On the

(1) The total of export in the first half of the season was actually 421 million bushels but has been reduced to 405 millions since the quantities afloat have increased by 16 millions.

*Forecast of European requirements of wheat for 1931-32 and net imports during the first 6 months of the season.*

	Forecast requirements for 1931-32	Net imports 1 August 1931-31 January 1932	Balance to be imported from 1 February to 31 July 1932
	(million bushels)		
Germany . . . . .	20	3	17
Austria . . . . .	18	7	11
Belgium . . . . .	48	23	25
Denmark . . . . .	18	11	7
Spain and Portugal . . . . .	5	1	4
Baltic Lands . . . . .	11	3	8
France . . . . .	55	30	25
Great Britain and Ireland . . . . .	265	141	124
Greece . . . . .	26	11	15
Italy . . . . .	44	5	39
Netherlands . . . . .	35	15	20
Sweden and Norway . . . . .	20	8	12
Switzerland . . . . .	26	12	14
Czechoslovakia . . . . .	29	14	15
Malta, etc. . . . .	4	2	2
Totals . . . . .	624	286	338

whole European demand in the second semester would not greatly exceed 55 million bushels a month, an amount which appears quite probable. According to these data, all the European countries would import in the second half of the season larger quantities than during the first, Denmark, the United Kingdom and France excepted. For the first two countries the decrease expected is quite possible when the heavy imports up to January are considered; for France, on the other hand, where home wheat supplies seem to be at present reduced to very small proportions, the balance to be imported from February to the end of the season would exceed, even to a large extent, the quantity expected. It is, however, possible that, contrary to what is seen in the case of France, the balance to be imported by Italy will be smaller than expected so that the differences in the estimates for the two countries may in practice balance.

*Extra-European countries:* For these countries as a whole an increased demand was forecast last October owing to the general extension of consumption stimulated by the low prices in several countries and to the precarious food situation in vast areas of China. The wheat requirements of these countries were estimated at 240 million bushels against 200 million in the preceding season. The commercial movement in the first six months of the season appears to indicate that the expectations of October have not only been fully verified but perhaps even exceeded. The quantities exported by all exporting countries from 1 August to 31 January were 421 million bushels; imports from Europe were 286 millions and quantities afloat increased by 16 millions between these dates. In consequence the exports of wheat to extra-European destinations during the first half of the season were 120 million bushels. If these exports remain at the same level in the second half of the season a total of 240 million bushels will be attained, which

corresponds to our forecast of October. We believe, however, that if prices in the coming months do not rise much above the present level there will be a further improvement in demand in extra-European countries and consequently it seems to us well funded to raise the estimate of the probable requirements of these countries to 256 million bushels.

*World requirements* : In conclusion, the estimate made in October of the requirements of importing countries remains unchanged at 880 million bushels, since the slight decrease in the estimate for Europe will be compensated for by the increase for countries outside Europe.

*End-of-season stocks* : If the estimates of exportable surpluses in the present season, revised to 1,338 million bushels, and those of probable requirements on the world market, maintained at 880 millions, are compared it is seen that there will remain on 31 July 1932 a total stock of 458 million bushels to be carried over into 1932-33 ; this figure is much higher than that of 360 millions calculated in October but it remains nevertheless to a very important extent below that of 1 August 1931 which was 546 million bushels.

#### WORLD SUPPLIES AND REQUIREMENTS OF WHEAT.

The statistical situation in the current wheat season as far as may be seen from the information available may be summarised as follows.

World production (excluding that of the U. S. S. R. and of the greater part of China) in 1931 is not so small as appeared some months ago, the deficit with respect to the 1930 crop, forecast at 170 million bushels, having been reduced to 74 million. The production of the U. S. S. R., for which estimates are at the moment lacking, is not large and in any case considerably inferior to that of last year. On the whole total production is confirmed as insufficient to cover requirements for consumption but the deficit has been reduced to modest proportions.

World exportable supplies, taking account of the exceptional stocks existing at the beginning of the season, are slightly below those of the preceding seasons — 1,338 million against 1,350 million bushels in 1930-31.

The probable requirements of the importing countries are, on the contrary, larger than in 1930-31 ; the European demand is estimated at 624 million bushels, a quantity 16 millions smaller than was forecast in October as a result of the better crop results recorded since that period ; the demand of the extra-European countries is estimated at 256 million bushels, showing an increase of 16 millions on the October estimate due to the large increase in consumption stimulated by low prices. The result is consequently a compensation between the estimated differences for Europe and the extra-European countries ; world import requirements may therefore be maintained at 880 million bushels, representing an increase of about 76 millions on last season. To meet these requirements, as the exportable surplus from the 1931 crop is not large enough, recourse must be had to the stocks of the old crop held in the exporting countries. These stocks on August 1, 1931, amounted to 546 millions bushels, the largest accumulated surplus on record. The portion of these large stocks, which may be consumed during the present season is much smaller than was estimated last October : 100 million bushels against 180 million. This quantity almost represents the deficit in world production in 1931 in relation to requirements for consumption.

On the basis of these data it may be estimated that the stocks, which at the beginning of the season reached 546 million bushels, will be reduced by 1 August 1932 to 458

millions, a quantity much larger than the 360 millions forecast last October. The accumulation of stocks at the end of this season will therefore again be very large and will continue to weigh heavily on the market if good crops are obtained in 1932.

\* \*

As regards crop prospects for the coming season the information that has arrived at the Institute may be summarised as follows.

For Europe data on the areas sown to winter cereals are still incomplete but the information available appears to confirm the impression that they will be slightly greater than last year for both wheat and rye for the European countries as a whole, excluding the U. S. S. R., where on the other hand there is an increase of wheat sowings and a marked contraction in the case of rye. The situation of the crops, though satisfactory at the middle of March in the majority of Western European countries, was less so in those of Central and Eastern Europe, where sharp falls in temperature and frosts caused damage. Sowings have suffered particularly in Germany, Poland, Czechoslovakia, Austria, Hungary, Bulgaria and the U. S. S. R. but the real extent of the damage cannot be known until next month.

In the United States the return of cold weather in the first half of March caused slight damage to crops in the ground. In British India drought continued in February in the principal zones of production, despite the increase of area under wheat a crop scarcely equal to that of last year is expected. In North Africa the situation of crops in mid-March was good thanks to abundant rains.

G. CAPONE.

## CEREALS

*Austria* : The fall in temperature toward the end of January was accentuated in the first part of February with sharp frosts. In the latter half of February snow was frequently reported but the amounts were small. In many places there was a lack of water due to the smallness of precipitation and to frosts.

As winter sowings remained without protection from the wind they suffered greatly from frost. In places winter wheat almost completely dried up. The condition of rye and winter barley sowings also deteriorated but barley showed greater resistance.

On 1 March condition of winter cereals was as follows : wheat 2.9 against 2.7 on 1 February 1932 and 2.5 on 1 March 1931 ; rye 2.8 (2.5, 2.4) and barley 2.7 (2.4, 2.5).

*Belgium* : The area under winter spelt in 1931-32 is estimated at 33,800 acres against 55,700 last season and 38,800 on the average of the five seasons ending 1929-30. Percentages 60.7 and 87.1. The area of mixed grain was respectively 8,500 acres, 9,500 and 11,600 acres. Percentages 90.1 and 73.3.

In the first decade of February temperatures were mild ; subsequently severe cold set in, with night frosts and a predominance of dry cold winds from the north and north-east. Winter cereals have a good appearance. Sowings of oats have begun.

Crop condition of these two products as well as of other winter cereals (wheat, rye, barley) on 1 March was considered good.

Work in the fields for spring sowings was carried out under excellent conditions.

*Area sown with winter cereals.*

COUNTRIES	WHEAT			RYE			BARLEY			OATS		
	1931/32	% 1931/32		1931/32	% 1931/32		1931/32	% 1931/32		1931/32	% 1931/32	
		1930-	1925-		1930-	1925-		1930-	1925-			
		1931	to		1931	to		1931	to			
		= 100	1929- 1930		= 100	1929- 1930		= 100	1929- 1930		= 100	1929- 1930
(thousand acres)												
Germany . . . .	4,880	104.9	128.3	11,112	104.7	97.8	583	108.0	131.4	—	—	—
Belgium . . . .	338	99.5	97.9	573	103.6	100.9	78	111.2	106.6	—	—	—
Bulgaria . . . .	2,055	100.6	108.6	559	99.2	114.8	489	101.3	106.4	—	—	—
Spain . . . . .	10,601	95.2	98.3	1,469	95.0	88.6	4,553	100.2	101.6	1,826	94.1	96.0
Finland . . . .	30	92.3	112.3	544	96.0	98.7	—	—	—	—	—	—
France . . . . .	12,894	110.0	102.8	1,791	102.7	94.3	432	92.9	105.6	2,205	101.4	109.1
Italy . . . . .	12,035	100.3	—	—	—	—	—	—	—	—	—	—
Lithuania . . .	376	99.3	142.6	1,229	98.4	106.1	—	—	—	—	—	—
Poland . . . . .	4,000	96.7	122.9	14,260	100.4	101.9	127	99.1	72.5	—	—	—
Rumania . . . .	5,596	90.9	—	686	85.4	—	245	98.7	—	—	—	—
U. S. S. R. . . .	32,337	111.4	132.2	64,765	93.4	93.6	872	100.4	85.9	—	—	—
Canada . . . . .	518	92.5	52.7	530	90.1	73.7	—	—	—	—	—	—
United States .	38,682	89.6	80.6 (x)	3,712	93.0	(2) 96.3	—	—	—	—	—	—
British India: .	33,745	108.8	110.1	—	—	—	—	—	—	—	—	—
Syria and Liban	1,192	102.1	106.6	—	—	—	810	86.0	108.6	28	102.3	66.6
Algeria . . . . .	(3) 3,633	99.8	97.2	4	77.2	97.7	3,262	102.6	93.1	556	99.7	92.0
Cyrenica . . . .	6	32.7	18.4	—	—	—	47	57.7	47.5	—	—	—
Tunis . . . . .	2,100	110.4	118.1	—	—	—	1,236	113.6	100.1	99	100.0	96.6

(1) Acreage sown for grain allowance being made for average diversion to other uses. — (2) Percentage of the mean for 1926/27 to 1929/30. — (3) Area sown last year at the same date (1 March, 1931): 3,081,000 acres.

*Bulgaria*: At the beginning of February there were very severe frosts which seriously damaged winter sowings, especially wheat, barley and colza. The snow in the middle of the month, however, considerably improved crop condition.

*Estonia*: On March 3, work preparatory to spring sowings had still not commenced.

*Irish Free State*: Weather and soil conditions during February, which was dry and genial, were excellent for cultivation and spring sowings of oats were begun on the warmer lands.

*France*: The period from mid-February to mid-March was dry and cold, with heavy falls in temperature and frequent severe nocturnal frosts. These conditions were good for the land and for crops and were so far rather favourable to cereals in the ground. Winter oats were, however, in a number of localities touched by frost and toward the end of the period under consideration had begun to suffer in some regions. On the other hand, the almost complete absence of rains since mid-January in the principal cereal areas caused fears for the crops. The sparse rains at the beginning of the second week of March, though insufficient, brought a beneficial humidity, but the frosts immediately following caused some damage to crops in land still insufficiently moistened.

Toward the middle of March crop condition was generally satisfactory save as regards oats. Rain was considered indispensable for a good crop; very serious losses were feared where the thaw was unaccompanied by precipitation.

Work preparatory to the spring sowings was generally effected under good conditions and at the end of February had made very good advance. At the beginning of March it was hindered in many districts by the frozen, dry state of the soil.

Rainfall in the second week of the month was insufficient; more abundant precipitation was indispensable to permit the completion of field work and to enable the spring oat and barley sowings already begun to be accomplished under good conditions.

*Great Britain and Northern Ireland*: Weather in February was on the whole dry and mild until the latter part of the month, when cold winds checked growth. Wheat was reported to be healthy and vigorous save in exposed situations; in Scotland crop condition was 115; oats and barley were in the same condition.

Cultivation was generally well forward and spring sowings are early.

*Greece*: Area in 1931 of meslin was 118,000 acres, an increase of 7.3% on that of the preceding year (110,000 acres) and an increase of 5.4 % on the average of the five years ending 1929 (112,000 acres). Production in 1931 was 598,000 centals (1,031,000 bushels), an increase of 37.7 % on that of the preceding year (434,000 centals; 749,000 bushels) and an increase of 12.9 % on the average of the five years ending 1929 (529,000 centals; 913,000 bushels).

*Hungary*: During the three weeks from February 20 to March 12, the weather was characterised by deficient precipitation and low temperatures. In the eastern half of the trans-Danubian region and between the Danube and the Theis, the quantity of precipitation barely exceeded half the normal quantity while in the western half of the trans-Danubian region and in the eastern half of the Alföld plain, it reached only  $\frac{1}{3}$  of the average quantity for this period.

In the last few days of the period considered the southern half of the country was covered by a layer of snow more than 5 cm. thick while the western regions had about 2 cm.

Winter wheat, especially that sown later was greatly damaged throughout the country by cold, wet weather. The damage is already visible in many districts but its extent cannot yet be estimated. The winter rye sowings have resisted better but are also weak.

Due to the cold, it had not yet been possible to begin sowing spring cereals.

*Italy*: Despite frequent, sharp frosts in February, wheat sowings at the beginning of March were in good condition as were also those of minor cereals.

*Latvia*: After relatively warm temperatures in January, the weather in February was cold. The cold set in at the beginning of the month; on the 10th the temperature was  $-14^{\circ}$  c. rising again towards the 20th and falling at the end of the month as low as  $-23^{\circ}$  c. in some regions. During February there were some violent winds; precipitation was nearly normal but the snow cover was generally below the normal in depth.

*Lithuania*: February weather was not colder than usual. Thanks to the protective layer of snow on the fields, winter wheat was in favourable condition. Preparatory work for spring sowings had still not commenced on March 8.

*Poland*: In the first few days of February, there was a sudden fall in temperature lasting until the end of the month and bringing the average for February below the multi-annual average for the month. Subsequently, snowfall on the frozen soil covered

the winter sowings with a fairly thin layer. The snow was relatively less abundant in the departments of Posnania, Pomerania, Lodz and Silesia.

The low temperature and the thinness of the snow-cover which, moreover, in the more elevated regions has been removed by strong winds, give rise to fears that the winter sowings have been more or less considerably damaged. Most correspondents at present report, however, that the condition of the sowings remains unchanged from last month.

*Portugal* : The appearance of winter sowings at the end of February was regular. Spring wheat sowings had made good progress.

*Rumania* : In the first half of February there was a sharp fall in temperature. Severe frost was felt in the second decade of the month. On 15 February the minimum temperature at Cluj was  $-32^{\circ}\text{C}.$ , at Timisoara  $-25^{\circ}\text{C}.$  and in Bessarabia  $-18^{\circ}\text{C}.$

Abundant precipitation was registered in Bessarabia and Moldavia. In mid-February the snow-cover was considered sufficient for the protection of winter cereals from the very severe frost. The ultimate losses to sowings could not yet be estimated. According to a report dated 5 March weather was then favourable and the snowcover thick. Frost damage to sowings was not important.

Crop condition on 1 March was good for wheat, rye and winter barley.

*U. S. S. R.* : According to information sent by the People's Commissariat for Agriculture, the crop condition of winter cereals at the beginning of March in the Union was good.

At the beginning of March, sowing of spring cereals had not yet commenced. In the meantime preparations continued for spring sowings and field operations. The government has decided that for spring cereal sowings on the kolkhoz farms, the latter should form a seed reserve of 126,447,000 centals. As during last summer in the eastern regions of the Union (Lower-Volga, Middle-Volga, Urals, Kazakstan, Bashkiria, western Siberia and Tartary) damage was caused by drought, also because a certain number of kolkhoz and sovkhoz in these regions could not themselves provide the necessary seed and lastly because some kolkhoz and sovkhoz have also encountered difficulties in ensuring the supplies required to meet needs for consumption the Government has decided to grant to the farms of these regions in the form of a loan (without interest) repayable during the following autumn of 19,320,000 centals of cereals, of which 14,084,000 for the kolkhoz and 5,236,000 for the sovkhoz. The date by which the seed reserve is to be formed is fixed at March 10 for the Ukraine, the Lower-Volga, the North-Caucasus, Crimea and Central Asia and April 1 for the remainder of the Union.

According to the data of the People's Commissariat for Agriculture, there had been collected for the seed reserve by March 10, in the kolkhoz, the 54.4 % of the plan.

The reserve is being formed much more slowly than last year.

On March 10, the number of tractors repaired reached 64,521, that is, 60.3 % of the figure anticipated.

The plan for the purchase of cereals by the State, State organisations and co-operatives had, on March 1, 1932, been carried out to the extent of 91.2 %.

*Yugoslavia* : February was characterised by frequent frosts and by a relative lack of snow but as far as could be judged autumn cereals did not suffer from the cold.

*United States* : The mild weather in the week ended on March 2 over the main winter wheat section promoted some growth or greening in most parts and the crop was forward

for the season. In the southwestern section of the belt, progress was good and wheat greened up and made noticeable growth in Kansas, although fields were too soft for grazing. Abnormal warmth over the Northwest melted most of the snow-cover and the ground was largely bare from the western Lake region to the Pacific States; unfavourable freezing and thawing were reported locally. Winter cereals continued to do well in the South and East. Moisture was needed in the west-central Great Plains.

Spring ploughing made good advance under favourable conditions and was in progress as far north as Kansas and some Ohio Valley sections. Some spring oats were sown as far north as central Indiana, central Missouri and southeastern Kansas, while the early crop was reported 6 to 10 inches high in southeastern Arkansas. According to later telegrams received from the Government of the United States, on March 9 the weather had turned cold, slightly damaging the winter wheat crop and on the 16th, cold weather had continued, delaying crop progress and causing slight damage.

On March 3 the Government adopted the resolution authorizing the distribution of 40,000,000 bushels of government owned wheat to official organisations for the relief of the distressed and for feeding livestock.

*Mexico* : Crop condition varied from average to good in the principal producing districts.

*Cyprus* : With the advent of rains toward the middle of February, the situation of cereals, which had been bad, improved. At that date sowing of wheat had practically been completed and germination had taken place satisfactorily in most areas; if favourable weather conditions continue, a fairly good yield may be expected. Prospects for barley production, on the contrary, are on the whole poor.

*India* : In February the weather in the Punjab was again predominantly dry except for light rainfall in the second week in most districts and in the last fortnight in a few districts. On March 7 rain was badly needed and condition remained average to good on irrigated areas and below average to average on non-irrigated areas. Rats caused some damage in Gurgaon in the extreme southeast of the Punjab.

In the United Provinces February weather was again mainly dry; in the third week, however, it was reported that rainfall, except in nine districts, had been light throughout, harming standing crops in some places. In the latter half of the month local damage by rats, white ants, frost and hailstorms was reported. On March 5 crops were doing well and prospects for crops on irrigated areas were favourable whereas on unirrigated lands they were poor. In the Central Provinces weather was cooler with some frost in the latter half of February; light showers of rain and hail fell in the western area, slightly damaging the crops; rain did some good in the North but was too late in the South. Wheat was reported to be withering in Hoshangabad from want of rain; otherwise the condition of standing crops on March 7 was good.

*Japan* : On 1 March the crop condition of wheat and barley were generally considered to be average; weather conditions were favourable.

*Palestine* : Although on January 31 the total rainfall registered in most parts of the country was far below the average, its distribution was well suited to the requirements of cereal crops. A marked increase in the rainfall has to be noted during the first ten days of February. Crop condition as at March 1st was poor. Rain is urgently needed throughout the country.

*Syria and Lebanon* : In Syria sowings were effected in good conditions and germination has been regular. The rains have been late and rather scarce. Sowings vary



as follows from those of last year: wheat + 3 %, barley — 18 %, oats + 4 %. In Lebanon conditions at time of sowing were average; germination has been irregular. Areas sown to wheat and barley do not show any great change from those of last year, while that sown to oats is 35 % less, this crop being of diminishing importance owing to the absence of demand. In Latakia sowings were made in good conditions and germination has been regular and uniform. In relation to last year the area sown to wheat is 5 % smaller, that to barley is 25 % larger and that to oats 11 % larger. Weather in February was normal. In Jebel-Druze germination has been irregular, the autumn having been very dry. Up to the end of February frost had not caused damage to cereals.

*Algeria*: Rains in February and the first week of March following dry weather in January, have largely compensated for the inadequacy of precipitation at the beginning of the season. Cold weather has checked growth, which was generally ahead of the normal. Alternation of rainy and sunny days and milder temperatures at the end of February were very beneficial to the crops, the appearance of which was generally very good; on heavy lands, however, excessive moisture has hindered the growth and brairding of cereals.

According to a private source of information, the total cereal area is about 250,000 to 500,000 acres larger than that published in the official statistics. The increase is probable as the official data show no change in the area sown from February 1 to March 1 whereas actually some sowing has been effected during the month. It seems, therefore, that the cereal acreage may be taken to be definitely larger than that of last year and at least equal to the average of the previous five years.

Work for the spring sowings is progressing under good conditions; the February rains have slowed up the previously advanced growth. Sowing began under good conditions.

*Egypt*: The cold was severe up to the end of the first week of February, with heavy rains in Lower Egypt, particularly in the North of the Delta and in Gizeh province. It improved later and became warm. On the whole it has been favourable to the growth of the crops and the formation of ears. Ear formation has become general in early-sown areas. Some of the areas not manured before the closure of canals have now been manured. On the reopening of the canals the crop was given the second watering. Crop condition as at 1st March: wheat, 100, barley, 102, as against 100 on 1st February and 100 and 99 respectively on 1st March 1931.

*French Morocco*: Heavy rains in February following a long period of dry weather were of great benefit to the crops, which are still backward in growth and of not altogether satisfactory appearance. Work has been interrupted by bad weather.

*Tunis*: Opportune rainfall over the whole of the territory in the latter half of February greatly improved the situation of cereal crops the condition of which at the beginning of March was good (120).

## MAIZE

*France*: Preparatory work has generally been effected under good conditions thanks to fine, dry weather in the period mid-February to mid-March. Rain was however, considered indispensable for the completion of the last field operations and the sowings.

*Argentina*: The drought, dry weather and locusts have caused very considerable damage especially to the crops sown early. The crop is reported to be very poor and its quality little satisfactory.

*Tunis*: Thanks to rains in the latter half of February, work for sowings is proceeding under good conditions.

*Union of South Africa*: The more or less droughty conditions of December in the northern provinces and in the Natal Highveld continued until the end of January. Some isolated areas were favoured by good showers but generally precipitation was well below normal. The heavy rains in the Eastern Cape Province were, however, of great benefit and a successful crop season is expected in that area. In the greater portion of the Orange Free State, Transvaal and Natal, crops have been irreparably damaged by the drought and hail.

### Maize.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931/32	1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	1931/32
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	Aver. 1930/1931	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	Average 1930/1931
	1,000 acres					1,000 centals			1,000 bushels of 56 lbs				
Austria . . .	148	143	146	108.9	101.7	3,314	2,663	2,490	5,917	4,766	4,447	124.4	133.1
Bulgaria . . .	1,676	1,689	1,671	99.2	100.3	21,983	17,088	14,713	39,256	30,515	26,274	128.6	149.4
Spain . . .	1,053	1,106	1,057	95.2	99.6	14,778	16,152	13,144	26,389	28,844	23,471	91.6	112.4
France . . .	833	833	848	99.9	98.2	13,246	12,532	9,428	23,654	22,379	18,837	105.7	140.5
Greece . . .	528	546	503	96.7	105.0	3,008	3,809	3,597	5,371	6,802	6,423	79.0	83.6
Hungary . . .	2,720	2,605	2,662	104.4	102.2	33,459	31,021	39,546	59,749	55,394	70,618	107.9	84.6
Italy . . . (s)	3,426	3,490	3,541	98.1	96.7	41,519	62,832	51,754	74,142	112,200	92,418	66.1	80.2
Poland . . . (s)	238	255	218	93.4	109.3	2,266	3,003	2,013	4,046	5,362	3,595	75.5	112.6
Rumania . . .	243	233	217	104.2	111.6	2,296	1,847	1,940	3,290	3,464	3,464	124.3	118.3
*Portugal . . .	865	863	827	99.6	104.6	...	9,364	7,050	...	16,722	14,196	...	...
Rumania . . .	11,749	10,989	10,606	107.4	110.8	140,214	99,648	99,979	250,384	177,942	178,534	140.7	140.2
Switzerland . . .	3	8	3	79.2	76.4	64	64	84	114	114	150	100.0	75.9
Czechoslov. . .	344	360	343	95.6	100.5	5,020	5,479	5,868	8,965	9,788	9,577	91.6	93.6
Yugoslavia . . .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	126,688	136,395	120,279	92.6	105.3
<b>Total Europe . . .</b>	<b>29,119</b>	<b>28,299</b>	<b>27,390</b>	<b>102.9</b>	<b>106.3</b>	<b>352,112</b>	<b>332,519</b>	<b>311,407</b>	<b>628,774</b>	<b>593,785</b>	<b>556,087</b>	<b>105.9</b>	<b>113.1</b>
*U. S. S. R. . .	9,801	9,684	8,386	101.2	116.9	...	...	79,114	...	...	141,275	...	...
Canada . . .	181	161	174	81.2	75.2	3,039	3,263	3,703	5,426	5,826	6,613	93.1	82.1
United States . . .	104,970	100,743	99,560	104.2	105.4	1,431,843	1,153,704	1,537,197	2,556,863	2,060,185	2,745,001	124.1	98.1
Mexico . . .	7,939	7,599	7,709	104.5	103.0	42,539	30,353	44,001	75,962	54,201	78,574	140.1	96.7
<b>Tot. N. Amer. . .</b>	<b>112,940</b>	<b>108,503</b>	<b>107,443</b>	<b>104.2</b>	<b>105.2</b>	<b>1,477,421</b>	<b>1,187,320</b>	<b>1,584,901</b>	<b>2,633,251</b>	<b>2,120,212</b>	<b>2,830,138</b>	<b>124.4</b>	<b>98.2</b>
China: Manchuria . . .	2,441	2,139	2,469	114.1	98.9	37,754	35,030	37,848	67,418	62,554	67,586	107.8	99.8
Syria and Leb. . .	67	61	121	109.7	55.2	770	600	1,370	1,376	1,071	2,446	128.5	56.2
Algeria . . .	24	24	25	99.2	97.0	133	164	144	238	292	257	81.3	92.7
Eritrea . . .	22	22	13	100.0	166.7	132	198	79	286	354	142	66.7	166.7
Kenya (1) . . .	196	206	201	94.9	97.6	1,922	3,299	2,476	3,432	5,892	4,420	58.8	77.7
Fr. Morocco . . .	864	649	561	133.1	154.1	2,982	3,335	2,978	5,954	5,309	89.4	100.3	100.3
It. Somaliland . . .	23	40	39	70.6	72.9	301	530	426	537	946	760	56.8	70.7
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	108	197	236	192	83.3	102.5
<b>Total Africa . . .</b>	<b>1,178</b>	<b>973</b>	<b>884</b>	<b>120.2</b>	<b>133.6</b>	<b>5,530</b>	<b>7,653</b>	<b>6,205</b>	<b>9,966</b>	<b>13,674</b>	<b>11,780</b>	<b>123.9</b>	<b>89.9</b>
*Argentina . . .	14,468	13,776	11,549	105.0	125.3	...	231,707	163,577	...	413,763	292,103	...	...
*Chili . . .	89	92	88	96.7	101.0	...	1,516	1,229	...	2,707	2,194	...	...
Madagascar . . .	227	229	207	99.2	110.0	2,028	1,623	2,302	3,622	2,898	4,111	125.0	88.1
<b>Grand Total . . .</b>	<b>146,072</b>	<b>140,209</b>	<b>138,514</b>	<b>104.2</b>	<b>105.5</b>	<b>1,875,665</b>	<b>1,564,750</b>	<b>1,944,033</b>	<b>3,349,407</b>	<b>2,794,194</b>	<b>3,471,498</b>	<b>119.9</b>	<b>96.5</b>

\* Countries not included in the totals. — s) Late crop («maggengo»). — t) Early crop («cinquantino»). — (1) European crop. — (2) Maize and sorghum.

## RICE

*Argentina* : According to the local press production in 1931-32 is estimated at over 200,000 centals (490,000 bushels). The chief producing area is Tucuman, where the local government has developed active propaganda for the intensification of the crop.

*Formosa* : On February 1st, except in a certain part of the Central and Southern districts, where cold weather hampered the growth of the seedlings, growing conditions were generally normal, weather being seasonable. Sowing was almost finished and transplanting of the early-sown crop started.

*Indo-China* : The crop of the tenth month in Tonkin 26,956,000 centals (59,901,000 bushels) of rough rice is rather below expectations being 91.8 % of last year's especially large crop and 19.3 % above the average of the five years ending 1929-30. Though production data for the crop of the second semester in Annam and for the crop of Cochín-China and of Cambodia, which together make up over half the total for Indo-China, are lacking, it may be stated from the general information available that the total crop of Indo-China will be 4.5 to 6.5 million centals. (100 to 14.5 million bushels) below that of the preceding season and 9 to 11 million (19.5 to 24.5 million) below the five-year average ; this year's crop will thus be one of the smallest in the last decade.

## Rice.

COUNTRIES	AREA					PRODUCTION							
	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32		1931/32	1930/31	Aver. 1925/26 to 1929/30	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32	
				1930/1931	Average							1930/1931	Average
	1,000 acres					1,000 centals				1,000 bushels of 45 lbs.			
Bulgaria . .	14	17	18	84.7	78.7	290	366	329	645	814	730	79.8	88.4
Spain . . .	113	120	121	94.2	93.6	5,869	6,892	6,743	13,042	15,318	14,985	85.2	87.0
Italy . . .	346	361	349	96.0	99.3	13,918	14,333	14,652	30,928	31,850	32,559	97.1	95.0
*Portugal . .	37	36	30	101.7	123.4	...	546	487	...	1,212	972	...	...
*U. S. S. R .	337	390	533	86.3	63.2	—	—	—	—	—	—	—	—
Unit. States	970	959	948	101.1	102.3	20,256	19,935	18,408	45,014	44,299	40,905	101.6	110.0
China: Man- churia . .	495	510	522	97.0	94.8	7,002	6,833	6,781	15,560	15,296	15,069	101.7	108.3
Formosa { a)	877	860	815	102.7	110.1	14,474	13,892	12,208	32,164	30,371	27,128	104.2	118.6
{ b)	888	858	797	103.5	111.5	16,689	15,500	13,971	37,086	34,444	31,046	107.7	119.5
Korea . . .	3,963	3,970	3,885	99.3	102.0	63,437	76,746	59,472	140,968	170,543	132,158	82.7	106.7
India . . .	84,034	82,706	80,758	101.8	104.1	1,180,438	1,110,706	1,047,336	2,512,033	2,468,186	2,327,363	101.8	107.9
Indo-China: { a)	877	1,137	1,048	77.2	83.7	5,472	7,829	9,033	12,160	17,397	20,073	69.9	60.6
{ b)	1,236	1,901	1,438	77.2	85.9	...	11,925	12,940	...	26,499	28,756	...	...
*Cochin-Chi- na . . .	4,930	5,460	5,033	90.3	98.0	...	40,874	43,368	...	90,829	107,549	...	...
Laos . . .	1,161	1,137	1,118	102.2	103.9	7,275	7,275	7,804	16,167	16,167	17,343	100.0	98.2
Tonkin . . .	3,801	3,410	3,097	96.8	106.3	39,981	44,108	33,362	88,845	98,016	85,247	90.6	104.2
Japan . . .	7,952	7,938	7,787	100.2	102.1	219,386	268,620	237,020	487,514	592,477	526,700	82.3	92.6
Siam (x) . .	(2) 8,677	(2) 4,084	(2) 3,543	91.1	103.8	49,601	58,018	54,454	110,222	128,925	121,007	85.5	91.1
Java and S	7,593	7,735	7,391	98.2	102.7	108,338	108,312	104,753	230,747	240,688	232,779	95.9	99.1
Madura { s	1,036	1,077	1,101	100.8	98.6	9,259	10,309	9,204	20,576	22,909	20,458	89.3	100.6
Madagascar	1,235	1,354	1,374	94.9	93.5	17,086	14,492	17,623	37,968	32,205	39,172	117.9	96.9
Totals . .	118,432	117,993	114,472	100.4	103.5	1,724,271	1,762,216	1,658,158	3,531,639	3,960,403	3,684,723	96.3	104.0

\* Countries not included in the totals. — a) First crop. — b) Second crop. — s) Irrigated rice. — u) Unirrigated rice. — (x) Seven inner circles, of which the production represents about three-fifths of the total production of Siam. — (2) Area to be harvested.

*India* : In the two weeks ending February 24 light rains fell in Bengal, facilitating ploughing for paddy but in the subsequent weeks ended on March 9 the weather was dry and rain was needed. Light to moderate rains fell in February in Bihar and Orissa but on March 7 rain was required in some districts. In Madras the weather was dry until towards the end of February when moderate rains fell in parts of the Circars, the central districts and the South of the Presidency.

## POTATOES

*France* : Preparatory work has generally been effected under good conditions thanks to fine, dry weather in the period mid-February-mid-March. Rain was, however, considered indispensable for the completion of the last field operations and the sowings.

*Great Britain and Northern Ireland* : February was very dry. In Northern Ireland planting was begun in a number of areas. Old crop tubers have kept exceptionally well.

*Argentina* : During February, the condition of potatoes in the principal producing areas was satisfactory. Crop prospects were generally good. Only in a few districts of the Province of Buenos Aires were yields forecast to be little satisfactory.

*Cyprus* : At the middle of February, planting of the new crop was continuing. Thanks to a good demand, especially from Palestine, it was estimated that two-thirds of the old crop had been exported at the date mentioned.

*Palestine* : Good germination is noted throughout the country. No damage from frost has been reported.

*Algeria* : Thanks to the abundant rains during February and to the mild temperatures in the last week of the month, yields of early varieties pulled at the end of February were better than those of the first tubers pulled.

Preparations for spring crops, though interrupted by bad weather, were well forward at the beginning of March.

## SUGAR

It is still impossible to state with sufficient exactness this year's area under cultivation for sugar-beet in Europe, not so much because the season is late in some countries as because certain factors in the international sugar situation on which the decisions of beet growers in large part depend remain uncertain.

As no agreement has been reached between Java and Cuba as to their production this year, the possibility of modifications in the export quotas of the beet-growing countries adhering to the Chadbourne plan cannot be excluded. For this reason the forecast of areas to be devoted to sugar-beet in these countries (Germany, Belgium, Hungary, Poland, Czechoslovakia and Yugoslavia) is especially uncertain though on the whole a decrease may be taken as certain. In other countries also the decision is partly conditional on the agreement amongst the countries adhering to the Chadbourne Plan. Another element of uncertainty is the fact that in various countries the beet price contracts for 1932-33 between growers and factories are still under negotiation. It is not easy to foresee what influence the measures taken by the various Governments in favour of their respective sugar industries in recent months may have.

## Production of Beet Sugar (raw).

COUNTRIES	Production 1 September-31 January				Total production during the season						% 1931-32	
	1931-32	1930-31	1931-32	1930-31	1931-32 (x)	1930-31	Average 1925-26 to 1929-30	1931-32 (x)	1930-31	Average 1925-26 to 1929-30	1930-31	Average = 100
	thousand centals		short tons		thousand centals		short tons		short tons		= 100	
Germany . . . . .	31,554	55,205	1,727,680	2,700,204	34,684	50,162	38,741	1,734,200	2,808,077	1,987,038	62	89
Austria . . . . .	3,585	3,312	170,223	165,588	3,641	3,313	2,185	182,000	165,620	109,260	110	167
Belgium . . . . .	—	—	—	—	4,519	6,138	5,949	225,071	306,894	297,449	74	76
Bulgaria . . . . .	553	1,122	27,636	56,007	508	1,204	602	28,307	60,205	30,090	47	94
Denmark . . . . .	—	—	—	—	2,756	3,609	3,303	138,000	185,000	165,147	75	83
Spain (4) . . . . .	(2) 6,376	(2) 5,338	(2) 318,808	(2) 200,878	6,393	6,369	4,813	320,000	318,449	240,638	100	133
Irish Free State . . . . .	—	—	—	—	125	468	436	6,257	28,800	21,794	27	29
Finland . . . . .	—	—	—	—	83	82	60	4,173	4,079	3,441	102	121
France . . . . .	(3) 18,753	(3) 25,701	(3) 107,044	(3) 128,535	18,804	28,034	18,258	948,200	1,301,712	912,888	72	103
Great Britain . . . . .	—	—	—	—	6,020	10,127	4,032	300,933	506,368	201,611	59	140
Hungary . . . . .	—	—	—	—	2,761	5,154	4,386	138,036	257,712	210,317	51	63
Italy . . . . .	8,268	9,498	113,385	474,903	8,208	9,498	7,039	413,385	474,903	351,957	87	117
Latvia . . . . .	—	—	—	—	287	132	(5) 204	14,300	6,625	(6) 10,185	216	141
Netherlands . . . . .	—	—	—	—	3,678	6,324	6,213	183,900	316,200	310,575	58	59
Poland . . . . .	(3) 10,874	(3) 17,253	(3) 543,705	(3) 802,636	10,874	17,253	15,045	543,705	802,636	752,221	63	72
Rumania . . . . .	—	—	—	—	948	3,620	2,745	47,400	181,010	137,268	26	34
Sweden . . . . .	—	—	—	—	3,153	4,112	2,881	158,000	205,618	144,032	77	109
Switzerland . . . . .	—	—	—	—	132	126	152	7,000	6,800	7,600	105	87
Czechoslovakia . . . . .	17,712	24,918	887,100	1,245,809	17,742	25,173	26,016	887,100	1,258,614	1,300,763	70	68
Turkey . . . . .	—	—	—	—	353	214	101	18,000	10,700	5,028	165	351
Yugoslavia . . . . .	—	—	—	—	1,955	2,326	2,082	97,752	116,316	104,100	84	94
<i>Total, Europe. a)</i>	—	—	—	—	127,804	187,528	145,252	6,391,709	9,376,423	7,262,406	68	83
U. S. S. R. . . . .	—	—	—	—	33,060	39,266	24,006	1,650,000	1,968,284	1,203,288	84	137
<i>Total, Europe. b)</i>	—	—	—	—	160,873	226,794	169,318	8,041,709	11,339,707	8,465,694	71	95
Canada . . . . .	—	—	—	—	1,058	1,075	760	53,000	53,763	38,435	98	138
United States . . . . .	—	—	—	—	21,022	25,979	21,428	1,201,000	1,209,000	1,071,300	92	112
<i>Totals, North America</i>	—	—	—	—	22,080	27,054	22,197	1,254,000	1,362,763	1,109,825	93	113
Korea . . . . .	—	—	—	—	37	22	13	1,837	1,109	635	166	280
Japan . . . . .	—	—	—	—	901	532	545	30,030	20,583	27,231	113	110
<i>Total, Asia.</i>	—	—	—	—	638	554	558	31,867	27,692	27,866	116	115
Australia . . . . .	—	—	—	—	114	75	48	5,706	3,752	2,410	152	230
<b>General total. a)</b>	—	—	—	—	153,636	215,211	168,655	7,643,282	10,760,630	8,402,513	71	91
<b>General total. b)</b>	—	—	—	—	186,765	254,477	192,121	9,333,282	12,723,914	9,665,801	73	97

a) Not including the U. S. S. R. — b) Including the U. S. S. R. — (x) Approximate data. — (2) To the end of January. — (3) To February 15th. — (4) The season begins on 1st July. — (5) Average 1928-29 to 1929-30.

As it is impossible to formulate an inclusive estimate for Europe there are here given the first replies to an enquiry of the Institute on the probable areas to be devoted to sugar-beet in 1932.

In France according to an agreement between growers and factories sugar production for 1932-33 has been fixed at an amount about 3 % above that of 1931-32. It is probable, therefore, that the beet area will undergo a corresponding extension.

From Germany it is intimated that current private estimates are unusually uncertain. It may however be taken that in consequence of the limitation of the export quota, the fall in internal consumption and the heavy stocks there will be a further decrease in area.

In Yugoslavia no precise information will be available before the first half of April.

In Hungary the factories have agreed with the beet growers' union to purchase in 1932 beets up to 70 % of 1931 production. It may therefore be approximately estimated meantime that this year's area will be about two-thirds that of last year.

From Italy it is intimated that, owing to the necessity for eliminating the heavy stocks of sugar accumulated in preceding years through the abundant crops and the contraction of sugar consumption the contract for 1932 between the National Association of Agriculturalists and the *Consorzio Nazionale Produitori Zucchero* no longer fixes the area to be cultivated but the maximum quantity of beets to be delivered. On this basis it may meantime be stated that, as for Hungary, the 1932 beet area will be approximately two-thirds that of 1931.

The Austrian Government intimates that according to the information so far available this year's beet area will not differ greatly from that of last year.

The Belgian Ministry of Agriculture intimates that the area under sugar-beet in the coming season will probably be nearly the same as that in 1931-32.

In Switzerland contracts for the quantity of beets to be delivered to the factories have not yet been made but it is generally considered that there will be a slight increase in comparison with last year.

In the U.S.S.R., according to the Government plan, the total area to be sown to sugar-beet this spring will be 12 % greater than the area cultivated in 1931.

E. R.

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*France* : Preparatory work has generally been effected under good conditions thanks to fine, dry weather in the period mid-February-mid-March. Rain was, however, considered indispensable for the completion of the last field operations and the sowings.

*Guadeloupe* : At the end of February, the crop was reported to be good.

*Formosa* : On February 1, the canes for cutting were damaged by frost in the central districts, but the crop prospects are normal on the whole.

New plantations were also damaged in the central districts, but no outbreak of noxious insects and moulds is found in general and the growth of the canes is healthy.

*India* : According to a report received from the Government of India, the condition of sugar cane on February 25 was reported to be good.

*Indochina* : Crop results have been satisfactory everywhere, varying from average to good according to province.

*Egypt* : Weather conditions have been favourable for sowing and maturity. Harvesting is proceeding in late and normally sown areas; the crop is consigned to sugar-factories and native presses or used for local consumption. Sowing of the new crop is being completed in Assuan province about two weeks earlier than last year. Crop condition on March 1 and February 1 was 103 as against 102 on March 1, 1931.

*Union of South Africa* : In January the rainfall in Natal was good over the South Coast and part of the North Coast but much below average in Zululand, where drought continued unrelieved. Condition of cane averaged 19 % below normal.

## Production of Cane Sugar.

COUNTRIES	1931-32 (1)	1930-31	Average 1915-26 to 1929-30	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	Percentages for 1931-32	
	Thousand centals			Short tons			1930-31 = 100	Average = 100
							%	
<b>AMERICA.</b>								
Argentina . . . . .	7,622	8,412	8,811	381,124	420,595	440,541	91	86
Brazil . . . . .	21,605	20,159	19,385	1,080,000	1,007,900	960,247	107	111
Cuba . . . . .	63,934	69,933	104,428	3,200,000	3,496,600	5,221,343	91	61
Ecuador . . . . .	423	425	432	21,160	21,800	21,577	99	98
United States . . . . .	3,120	3,674	1,911	156,000	183,693	95,575	85	163
Guadeloupe . . . . .	816	375	542	41,000	19,000	27,100	218	150
Jamaica . . . . .	1,323	1,279	1,329	65,000	64,000	66,438	103	99
Mexico . . . . .	5,290	5,247	1,242	265,000	262,000	212,109	101	125
Peru . . . . .	10,196	9,480	8,009	509,800	470,000	400,458	108	127
Porto Rico . . . . .	18,977	15,673	13,716	948,900	783,664	685,800	121	138
Dominican Republic . . . . .	8,407	8,125	7,707	424,850	406,237	385,339	105	110
El Salvador . . . . .	666	1,024	507	33,289	51,210	25,353	65	131
<i>Total, America . . . . .</i>	<i>112,169</i>	<i>143,806</i>	<i>171,019</i>	<i>7,127,000</i>	<i>7,186,700</i>	<i>8,550,889</i>	<i>99</i>	<i>83</i>
<b>ASIA.</b>								
Formosa . . . . .	20,270	17,577	13,629	1,013,952	878,841	681,427	115	149
India . . . . .	86,912	72,083	66,618	4,346,000	3,604,000	3,330,880	121	130
Japan . . . . .	1,951	1,793	1,857	97,525	88,153	92,850	111	105
Java . . . . .	54,013	62,603	57,172	2,700,000	3,133,116	2,858,554	86	94
Philippine Is. . . . .	18,900	18,796	16,404	950,000	980,771	820,180	101	116
<i>Total, Asia . . . . .</i>	<i>182,115</i>	<i>172,882</i>	<i>155,680</i>	<i>9,107,000</i>	<i>8,613,881</i>	<i>7,783,900</i>	<i>105</i>	<i>117</i>
<b>AFRICA.</b>								
Egypt . . . . .	3,197	2,685	2,094	159,800	134,300	104,691	119	153
Mauritius . . . . .	3,858	4,871	5,011	193,000	243,560	252,045	79	77
Mozambique . . . . .	3,417	1,907	1,022	171,000	95,300	81,076	179	211
Reunion . . . . .	661	1,102	1,116	30,000	55,000	55,775	60	59
Union of S. Africa . . . . .	6,588	7,880	5,297	329,400	393,000	204,871	84	124
<i>Total, Africa . . . . .</i>	<i>17,721</i>	<i>18,425</i>	<i>15,170</i>	<i>883,000</i>	<i>921,160</i>	<i>758,158</i>	<i>96</i>	<i>117</i>
<b>OCEANIA.</b>								
Australia . . . . .	13,140	11,027	11,283	657,000	596,374	564,162	110	116
Hawaii . . . . .	19,120	19,160	17,340	956,000	958,000	867,007	100	110
Fiji Is. . . . .	1,819	2,019	2,002	90,900	101,000	100,083	90	91
<i>Total, Oceania . . . . .</i>	<i>34,088</i>	<i>33,206</i>	<i>30,625</i>	<i>1,704,000</i>	<i>1,655,374</i>	<i>1,531,252</i>	<i>103</i>	<i>111</i>
<b>General Totals . . . . .</b>	<b>316,393</b>	<b>368,219</b>	<b>372,494</b>	<b>18,821,000</b>	<b>18,407,115</b>	<b>18,624,499</b>	<b>102</b>	<b>101</b>

(1) Approximate data.

## VINES

The winter of 1931-32 was marked in the northern hemisphere, by irregular precipitation and latterly, by abnormally low temperatures and very sharp frosts following a period of abnormally mild weather. It appears that the cold, despite its severity, has not caused serious damage; hardly any damage is reported except in some regions of Spain, where growth was at a fairly advanced stage, in the Loire valley and East of France, in northern Italy and in Hungary; in the rest of central Europe, opportune though limited snowfall aided the vines to survive the intense cold without suffering appreciable damage. In the Mediterranean basin the cold had, on the contrary, a beneficial effect in checking the too vigorous growth of the vines and the too rapid rise of the sap, putting the plants in better condition to resist eventually the dangerous spring frosts.

The drought is causing more serious anxiety in certain southern regions, particularly in Spain; it is to be feared that the vines in these areas will not have sufficient reserves

of soil moisture unless there is abundant precipitation in the spring to compensate for the deficiency in the winter.

With this reserve, it may be stated that the condition of the vines at the middle of March was, on the whole, very satisfactory except in Spain. Field work, which was delayed by the cold spell in January and February is generally fairly well advanced; in the southern regions, work has been effected under excellent conditions; pruning has progressed well in most districts and has been finished in North Africa; new plantings also benefited by the fine weather.

The cold was beneficial to the wines, which have clarified and have lost part of the excessive immaturity which was noticed in some regions.

*On the markets*, a quiet tone persists, except in certain German centres and in Hungary where purchases by neighbouring countries have caused a fairly marked activity and strengthened or even improved quotations. In most exporting countries, the practical closure of the French market in conjunction with the general crisis is limiting business to local purchases and even these are being prudently made. Spain and Italy are slowly selling on the home markets their relatively small supplies which, despite the stagnant business situation and restrictions imposed on consumption, are diminishing fairly regularly; in Greece, only the Samos trade has shown some activity. In France, trade in wine is very slow, although taxed consumption is maintained at a high level; sales of producers' stocks, although larger than last year, are smaller by 55 million Imperial gallons (66 million Am. gall.) than in the four previous seasons; transactions, which are being prudently made, appear to be principally in Algerian wines, sales of which have reached nearly three-quarters of the available supplies.

*Prices* have remained low but generally firm and in February rose very slightly. The conclusion of commercial agreements between France on the one hand and Spain, Italy and Greece on the other may bring about some improvement in the market situation in the latter countries.

In the viticultural countries of Danubian Europe, the situation remains generally poor except for the improvement which has taken place on the Hungarian market.

In the *southern hemisphere*, on the whole, a poor production is in prospect — extremely reduced in Argentina, smaller than in the previous year in Uruguay and in the Union of South Africa and fairly good in Australia. Probable supplies, however, in all countries on the whole exceed the possibilities of the market. The wine situation therefore remains bad and prices very low.

P. de V.

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*Austria*: Frosts hindered work in the vineyards. On 1 March crop condition was 2.6 against 2.3 on 1 February 1932 and on 1 March 1931.

*France*: The period from 15 February to the middle of March was marked by very great irregularity; low temperatures and drought prevailed with frosts very severe for the area, retarding vegetation and work in the vineyards. The milder temperatures and the rains toward the beginning of the second week of March restored the situation, which remained very satisfactory.

The markets were quiet despite the high level of consumption; after a slight rise in February, prices remained stationary; the application of the viticultural law brings a slight uncertainty to the situation.

*Italy*: The vines pruned recently have been damaged by frost.



*Argentina* : According to a report to the National Commission for the Wine Industry the total wine production of the provinces of Cuyo (San Juan and Mendoza), which include almost nine-tenths of the vine area of Argentina, will be diminished, owing to the very severe frosts that have destroyed part of the crop, to a little less than 44 million Imperial gallons (53 million American gallons), which represents, for the whole country, a crop hardly more than one-quarter of the normal. Despite this very small production, stocks from previous crops are apparently large enough to cover a considerable part of the demand and the total available supplies will still leave a surplus of 37 (45 million gallons at the end of the current season on 1 May 1933.

*Algeria* : Although work was often interrupted by bad weather in February and the beginning of March, it has not been greatly delayed. Planting is finished. Shoots are appearing early.

*French Morocco* : The young shoots are appearing slowly on the vines.

*Union of South Africa* : The total vintage for this year is estimated at 5-10 % greater than that of 1931, which was 18,600,000 Imperial gallons (22,337,000 American gallons). As regards the composition of these totals see the "Crop Report" for January 1932. The actual production will be very largely determined by the relative prices of raisins and wine, a very uncertain factor at present.

## OLIVES

*Production.* — The first estimate of Italian olive-oil production is now known and does not modify the figure of world production for 1931-32, forecast in December at about 18 millions centals (232 million American gallons). The estimates for the different producing countries have thus undergone no variation save for Tunisia where adverse weather during the later ripening of the fruit caused serious dropping and considerable delay in harvesting; the actual production of Tunisia and Algeria together, however, remains very large, almost 18 % above the average for the five years ending 1929-30.

For Portugal the first estimate indicates a particularly abundant production of oil; the most recent information is that in certain places extraction has not yet been completed as the total crop, though not reaching expectations, may be considered normal.

In Turkey production in 1931-32 is calculated at 331,000 centals (4,346,000 American gallons) against 617,000 (8,112,000) last season.

Sufficient information is not yet available to form a judgement on the quality of the oils produced in the current year. In Spain there is expected to be a large quantity of oil with a high acidity; the yield has there been 19.1 % (average of the last three years 19.3 %) while in Italy it is calculated at 16.3 % (three-year average 16.2 %).

*Trade* : —. As regards the movement of trade, it is noteworthy that, under the influence of two principal causes (the poor 1930-31 production in nearly all producing countries and the world economic depression), exports generally declined considerably in 1931 compared with 1930, especially those of Algeria and Tunis; it is calculated that these two countries together in 1931 exported a total quantity of only about 441,000 centals (5,794,000 American gallons) against 1,631,500 (21,438,000) in 1930 and 1,243,500

(16,339,000) in 1929 (total production of the two countries was 809,100 (10,632,000) in 1930-31, 1,898,200 (24,043,200) in 1929-30 and 1,486,000 (19,526,000) in 1928-29).

Spain also, although certainly assisted by the currency exchange, in 1931 exported about 286,600 (3,766,000) of oil less, the actual figures being respectively 2,070,100 (27,202,800) against 2,356,700 (30,969,000). Only Greece, favoured by a very heavy production in 1930-31, exported about 66,000 (869,000) more than in 1930, mostly destined to Italian ports.

With respect to Italy, it is known that in 1931 the small production of the year and a large demand for the foreign crude product on the part of the home refining industry, resulted in a large increase in imports from 1,325,000 (17,411,000) to 1,805,600 (23,726,000); the largest contributions to this increase were made by Spain, whose exports rose from 421,000 (5,533,300) in 1930 to 1,060,500 (13,934,600) in 1931; Italy therefore passed from a net export of 831,000 (10,921,700) in 1929 and 271,000 (3,563,300) in 1930 to a net import of 509,300 (6,692,000) in 1931.

### *Olives and Olive Oil Production.*

COUNTRIES	AREA				ENGLISH MEASURES			AMERICAN MEASURES			% 1931/32	
	1931/32	1930/31	Average 1925/26 to 1929/30	% 1931/32	1931/32	1930/31	Average 1925/26 to 1929/30	1931/32	1930/31	Average 1925/26 to 1929/30	1930/1931 = 100	Aver. = 100
	Thousand acres				Thousand centals			Thous-(s) pounds and (t) American gallons			%	%
Spain (1) . . . .	—	4,651	4,296	—	(s) 43,480	13,655	48,446	4,347,964	1,365,493	4,844,563	318.4	89.7
Greece . . . . .	—	—	—	—	(t) 8,309	2,534	9,153	109,187	33,288	120,273	327.9	90.8
Italy . . . . . a)	1,402	1,492	1,425	100.0	(s) 1,952	2,146	1,663	25,646	28,195	21,855	91.0	117.3
Portugal . . . . . b)	4,131	4,133	4,201	99.9	(s) 4,828	2,714	4,301	63,440	35,667	56,516	172.5	107.2
United States . .	—	—	—	—	(t) 1,504	396	1,153	19,763	5,205	14,884	379.7	132.8
Syria and Lebanon . . .	—	—	—	—	(s) 320	400	370	32,000	40,000	36,060	80.0	86.6
Algeria . . . . .	190	187	170	101.7	(s) 1,476	973	1,244	147,622	97,334	124,352	151.7	118.7
Tunis . . . . .	103	109	99	94.3	(s) 6,614	411	462	6,103	5,405	6,075	112.9	100.5
Totals . . . . .	—	—	—	—	(t) 1,100	400	880	14,500	5,200	11,600	278.0	125.0
	—	—	—	—	(s) 81,545	34,429	82,127	8,154,447	3,442,857	8,212,572	236.9	99.3
	—	—	—	—	(t) 18,137	8,601	17,392	238,639	12,970	231,202	211.3	103.2

a) Pure crop. — b) Mixed crop. — s) Olives. — t) Oil. — (1) Area bearing.

In correspondence with the movements of exports, all or nearly all the importing countries reduced their imports in 1931 compared with the preceding two years, especially the two most important countries: the United States, which passed from 1,528,000 (20,076,000) in 1929 and 1,630,000 (21,409,000) in 1930 to 1,191,000 (15,658,000) in 1931 and Argentina, whose imports were 1,122,000 (14,746,000) in 1929, 1,307,000 (17,179,000) in 1930 and 917,000 (12,052,000) last year.

As is known, Spain and Italy are the principal sources of supply of the two American markets mentioned above and the statistics indicate that nearly the whole of the trade decrease in 1931 as compared with 1930 is accounted for by Italy while Spanish trade was maintained at a comparatively better level as may be seen from the following statistical summary:

		1930		1931	
		1000 Centals —	1000 Amer. gallons —	1000 Centals —	1000 Amer. gallons —
<i>Argentina</i> : Olive oil, edible.					
Imports from Italy . . . . .	855	11,240	481	6,315	
"    "    Spain . . . . .	428	5,620	401	5,273	
"    "    other countries . . .	24	319	35	464	
<i>Total</i> . . .	1,307	17,179	917	12,052	

*United States* : a) Olive oil, edible.

Imports from Italy . . . . .	632	8,300	420	5,519
"    "    Spain . . . . .	246	3,230	240	3,158
"    "    other countries . . .	53	695	42	550
<i>Total</i> . . . .	931	12,225	702	9,227

b) Olive oil, sulphured, foots  
and other inedible.

<i>Total</i> . . . .	699	9,184	489	6,431
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(As is known, a large part of the sulphured oil imported into North America is taken from Italy : in 1930, about 55 % of the total was derived from this source).

*Prices* : -- During the first few months of 1931 prices on the world oil market showed a very firm movement, quotations being considerably above the average for the preceding year. At the beginning of the 1931-32 season, a progressive fall commenced, this however, being normal for the period of the year when to an increase in offers, there does not correspond a proportional demand on the part of consumption. The fall in prices was gradually accentuated in the last quarter of 1931 but was then checked at the beginning of the current year. The latest information available indicates that the world market, despite a certain scarcity of transactions, is well maintained and in fact, some indices would appear to give reason to anticipate a recovery in activity and a greater stability of quotations.

M. C.

\* \* \*

*France* : Olive-oil production has been below the average in quantity but of excellent quality.

*Italy* : The trees, recently pruned, have suffered from frosts.

*Palestine* : Pruning was concluded in February.

*Algeria* : The harvest is finished. According to a private source, production of oil, which crop forecasts and the good yield indicated to be probably average, will be somewhat reduced since owing to the poor prices, many small growers have not picked the fruit.

Cultivation is far advanced. Pruning and removal of dead branches is proceeding but owing to the bad economic situation, operations are somewhat neglected. Planting is almost completed. The mildness of the winter temperatures permits a good renewal of vegetation to be hoped for.

## COTTON

*U. S. S. R.* : According to the Government plan the total production of 1932-33 will be acquired by the State. The production is expected to be 35,639,000 centals of unginced cotton, equivalent to 11,120,000 centals (2,325,000 bales) of lint. In the following table is given the distribution of the area under cotton in the various republics and territories of the Union in 1931-32, on the basis of mensuration and the forecasts of area and production in 1932-33 as fixed by the Plan. The area devoted to cotton in the new crop zone in 1931-32 was 16.6 % of the total and the same proportion should be maintained in 1932-33. In the new zone the whole area under cotton is without irrigation while in the old zones the non-irrigated fields represent only about 4 %.

REPUBLICS AND REGIONS	Area (1000 acres)		Production 1932-33			
	1931-32	1932-33		Unginned (1000 cent.)	Ginned (1000 cent.)	Ginned (1000 bales)
		Total	Non- irrigated			
<i>Zones of old cultivation.</i>						
Uzbekistan . . . . .	2,384.1	2,078.4	98.6	19,063	6,266	1,311
Turkmenistan . . . . .	448.3	518.4	14.3	3,829	1,224	256
Tagikistan . . . . .	382.9	369.9	36.3	1,625	489	102
Kirghizia . . . . .	202.9	229.1	24.0	1,411	441	92
Kara-Kalgakiya . . . . .	134.4	159.6	4.0	944	295	62
<i>Central Asia . . . .</i>	<i>3,502.6</i>	<i>3,955.4</i>	<i>177.2</i>	<i>27,772</i>	<i>8,715</i>	<i>1,823</i>
Kazakhstan . . . . .	299.0	359.0	23.0	1,861	571	119
Azerbaijan . . . . .	493.5	560.4	6.9	3,179	1,001	209
Armenia . . . . .	61.8	74.1	—	417	130	27
Georgia . . . . .	49.2	69.7	3.0	280	86	18
<i>Transcaucasia . . . .</i>	<i>604.5</i>	<i>704.2</i>	<i>9.9</i>	<i>3,876</i>	<i>1,217</i>	<i>254</i>
<i>Total for zones of old cultivation . .</i>	<i>4,406.1</i>	<i>5,018.6</i>	<i>210.1</i>	<i>33,509</i>	<i>10,503</i>	<i>2,196</i>
<i>Zones of new cultivation.</i>						
Northern Caucasus . . . . .	396.6	427.5	427.5	732	212	44
Daghistan . . . . .	52.1	61.8	61.8	106	31	6
Crimea . . . . .	67.5	86.5	86.5	159	46	10
Region of the Lower Volga . . . . .	1.5	4.9	4.9	31	9	2
Ukraine . . . . .	357.1	422.6	422.6	1,102	320	67
<i>Total for zones of new cultivation. .</i>	<i>874.8</i>	<i>1,003.3</i>	<i>1,003.3</i>	<i>2,130</i>	<i>618</i>	<i>129</i>
GENERAL TOTAL . . . .	5,280.9	6,021.9	1,213.4	35,639	11,121	2,325

*Argentina* : According to information published in the national press, the cotton acreage this year should exceed that of 1930-31. In the Chaco, which is the principal producing area, there should be an increase in area sown whereas in Formosa it should be the same as last year and in the provinces of Corrientes and Santiago a decrease is anticipated.

*United States* : According to the final ginning report issued by the Bureau of the Census, the total quantity of cotton, not including linters, ginned from the 1931-32 crop, amounts to 16,596,000 running bales counting round bales as half bales, equivalent to 17,061,000 bales of 500 pounds gross-weight, as against 13,756,000 running bales and 13,932,000 bales of 500 lb. in 1930-31 ; 14,548,000 and 14,825,000 in 1929-30 ; 14,297,000 and 14,478,000 in 1928-29 ; 12,783,000 and 12,956,000 in 1927-28.

The average gross weight of the running bales for 1931-32, counting round bales

as half bales and excluding linters, is 514.04 lbs, as against 506.4 in 1930-31, 509.5 in 1929-30, 506.3 in 1928-29 and 506.8 in 1927-28.

The supply of cotton in the United States, according to a recent official report, was reduced by 1,345,000 bales in January so that the apparent supply on February 1 was about 15,700,000 bales or about 4,000,000 bales more than on February 1, 1931. The large reduction in January is explained by heavy exports to China and Japan and increased cloth sales. According to a telegram of March 23 planting has begun in the southern section of the cotton belt but in the northern section the weather was unfavourable and work on the land was hindered.

*Guadeloupe* : The crop is reported to be irregular, the Sea Island variety having been damaged by rain in November and December whereas the indigenous plants promise good yields.

*Mexico* : Preparation of the soil and sowings were carried out under good conditions. Crop condition is generally satisfactory. The excessively dry weather that predominated in January caused some damage in Vera Cruz.

*India* : According to a report received from the Government of India the condition of the cotton crop on February 25 was only fair.

*Algeria* : It is reported that low prices and loss of part of the previous crop by parasite damage have caused a large number of farmers for the time being to abandon cotton growing.

*Egypt* : The weather continued to be severely cold up to the end of the first week in February. It was very rainy in Lower Egypt, but improved later and became favourable to cultivation and sowing. Cultivation started seriously in January, but was suspended in Lower Egypt during the period from January 20 to February 10 owing to severe cold and rain. At the end of this period, activities were resumed. A large area has been prepared. During the latter half of February, certain areas in Lower and Upper Egypt have been sown. Cultivation is considered to be a fortnight later than it was last year. Sowing is also considered to have been delayed a fortnight in Lower Egypt and about ten days in Upper Egypt.

Cotton ginned from 1 September to end of February, in centals and in bales of 478 lbs. net weight, was as follows :

		1931-32	1930-31	1929-30	1928-29
Sakellaridis . . . . .	(centals)	1,033,400	1,441,700	2,083,020	2,128,820
	(bales)	216,190	301,610	435,780	445,360
Other varieties . . . . .	(centals)	4,241,900	4,306,120	4,694,010	4,688,950
	(bales)	887,430	900,860	982,010	980,950
<i>Total lint</i> . . . . .	(centals)	5,275,300	5,747,820	6,777,030	6,817,770
	(bales)	1,103,620	1,202,470	1,417,790	1,426,310
Scarto (linters) . . . . .	(centals)	140,480	139,490	160,310	194,540
	(bales)	29,390	29,180	33,540	40,700

The corresponding figures as at the end of January 1932 were respectively as follows : 916,610 centals (191,760 bales) ; 3,875,870 (810,850) ; 4,792,480 (1,002,610) ; 125,320 (26,220).

*Anglo-Egyptian Sudan* : The last report from the Sudan Government indicates a decrease in the area for 1931-32 of 20,800 acres in relation to last month's figure. The decrease relates to irrigated Sakellaridis at Tokar and is due principally to insects and to the salinity of the new lands.

The quantity of cotton harvested up to the end of January, 1932, expressed in terms of ginned cotton amounted to 217,400 centals (45,500 bales) compared with 150,131 (31,400) in 1931; 147,400 (30,800) in 1930; 173,200 (36,200) in 1929 and 100,200 (21,000) in 1928.

*Uganda* : Weather in January was generally hot and dry. Most of the crop was picked during the month in the Eastern Province, and yields per acre were anticipated to be satisfactory, particularly in the Budama district. In some districts of the Buganda Province a large proportion of the crop still remained to be picked at the end of January, and many growers were holding in the hope of better prices.

In the Northern Province crop prospects were not so satisfactory as in the Eastern Province, while in the Western Province they were generally good. In the latter Province picking was just beginning, but the bulk of the crop was not expected to be picked before the second half of March.

Buying commenced in all Provinces on January 25th but sales from this date to the end of the month were very small, except in the Eastern Province where they were fair.

## FLAX

*Belgium* : A decrease in flax cultivation in favour of potatoes and possibly of sugar-beet is expected.

*Canada* : The area of flax for fibre in Canada in 1931 was 4,200 acres compared with 6,100 in 1930 and 5,500 on the average for the preceding five years; percentages : 68.7 and 76.4. Production of seed and tow was as follows :

	1931	1930	Average 1925-29	% 1930 = 100	% 1931 Av. = 100
	—	—	—	—	—
Seed (centals) . . . . .	20,100	34,800	25,400	57.6	79.1
(bushels) . . . . .	35,900	62,200	45,400		
Tow (centals) . . . . .	60,400	121,700	80,200	49.6	75.3
(sh. tons) . . . . .	3,020	6,090	4,010		

Production of fibre in 1931 is estimated at 250 centals.

*India* : Mostly light rains fell during February in Bihar and Orissa, only a few districts remaining rather too dry; at the end of the month the condition of the standing crops was good. In the United Provinces the weather was dry apart from some light rains in the middle of the month; some local damage was caused by hailstorms, rats, frost and white ants; on February 27 standing crops were doing fairly well and prospects for crops on irrigated areas were favourable. Light showers of rain and hail slightly damaged crops in the western half of the Central Provinces; the moisture was beneficial in the North but fell too late in the South; otherwise the condition of standing crops on February 29 was fairly good.

*Palestine* : Germination was good and the crops are developing well. There is every prospect of a good crop. Condition on March 1 was average.

## TOBACCO

*Algeria* : Tobacco sowings have generally been a success although the cold has checked their growth. An extension of the plantations is counted upon.

## HOPS

*Belgium* : Hop growing shows a decline.

## OTHER PRODUCTS

### Cacao.

*Gold Coast* : Harvesting was completed in most districts in January. The weather was dry and facilitated harvesting and transport from distant farms to the roads. The small but steady decline in price destroyed any tendency to hold for a rise and this, together with the general shortage of money, caused the majority of growers to market their crop as soon as ready.

In Ashanti the crop has turned out better than expected. Favourable weather and low disease incidence resulted in the later part of the crop being larger than anticipated. At the end of January only about 5 % was still unsold. Arrivals in and railings from Kumasi were continuous. It was thought that production might exceed by 4 ½ to 7 million pounds the original estimate of 134 million pounds.

In the Eastern Province reports from all districts confirmed the estimate of a low yield and the estimated total for the province was unchanged. In the Central Province practically the whole of the crop had been marketed in the north while in the south 15 % remained ; the crop in the south proved a little better than anticipated but this was offset by the shorter crop in the north. The position in the Western Province was unchanged.

	January 1932	October 1931 to January 1932	January 1931	October 1930 to January 1931
Arrivals by rail at Takoradi and Accra (1000 lb.) . . . . .	59,808	108,014	78,879	134,324
Shipments from Takoradi and Accra (1000 lb.) . . . . .	76,615	183,752	50,268	128,439
Shipments from all ports (1000 lb.) .	94,886	230,064	58,110	147,582
Stocks at Takoradi and Accra beach at end of January (1000 lb.) . .	49,963	—	—	—

### Tea.

*India* : In North India, weather conditions during January were seasonable ; no crop was harvested during the month. In South India the weather was cold and not favourable to the growth of the crop, prospects for which were rather poor ; outturn in January was slightly behind that for the corresponding month of last year.

## SUPPLEMENTARY FIGURES

As the production and area for most countries were published in the February number of the Monthly Crop Report and Agricultural Statistics, it is not necessary to repeat them again this month. Hence only the new data and any modifications of the figures published last month are given in continuation. In another table is shown the total world production based on the figures received up to the time of going to press.

COUNTRIES	(†) AREA					(‡) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930 1930/1931 = 100	Aver. = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 1931 1931 = 100	Aver. = 100
	1,000 acres					1,000 centals			thous. bush. (60 pounds)				
WHEAT.													
Irish Free State . .	21	27	29	78.0	71.4	468	655	684	781	1,002	1,130	71.5	68.5
Greece . . . . .	1,390	1,396	1,251	99.5	111.1	7,319	5,826	7,334	12,199	9,709	12,223	125.6	99.8
Hungary . . . . .	4,011	4,187	3,821	95.8	105.0	43,531	50,004	47,726	72,550	84,338	79,542	86.0	91.2
Netherlands . . . .	192	142	135	135.2	141.9	4,051	3,634	3,623	6,751	6,056	6,037	111.5	111.8
Portugal . . . . .	1,271	1,104	1,071	115.2	118.7	7,790	8,290	6,102	12,909	13,817	10,171	94.1	127.8
Cyprus . . . . .	185	184	180	100.4	102.4	1,006	1,124	1,110	1,077	1,873	1,860	80.5	80.9
French Morocco . .	2,477	2,957	2,632	88.8	94.1	17,811	12,782	14,942	29,084	21,302	24,002	130.3	119.2
Kenya (†) . . . . .	(2) 59	(2) 71	(2) 57	83.7	104.3	211	389	358	352	648	597	54.4	59.0
Tunis . . . . .	1,927	1,903	1,719	101.3	112.1	8,378	6,239	7,068	13,002	10,308	11,780	134.3	118.5
Argentina . . . . .	(2) 17,295	(2) 21,283	(2) 20,484	81.3	84.4	135,550	141,578	145,819	225,922	235,058	243,026	95.7	93.0
Chile . . . . .	1,426	1,610	1,602	88.6	89.0	13,680	12,714	17,255	22,800	21,190	28,758	107.6	79.3
New Zealand . . . .	276	252	227	109.5	121.8	3,996	4,548	4,582	6,660	7,580	7,637	87.0	87.2
RYE													
Irish Free State . .	4	4	6	99.6	60.4	61	66	96	thous. bush. (56 pounds)				
Greece . . . . .	179	157	121	113.5	147.5	1,017	1,028	868	1,110	1,18	1,172	93.1	63.9
Hungary . . . . .	1,486	1,611	1,649	92.2	90.1	12,136	15,007	10,836	18,15	1,837	1,549	98.8	117.2
Netherlands . . . .	445	475	489	93.6	91.1	7,933	8,340	8,866	21,672	28,406	30,064	76.3	72.1
Portugal . . . . .	427	406	488	105.3	87.4	2,839	2,744	2,464	14,167	14,892	15,832	95.1	80.5
French Morocco . .	2	2	2	116.3	132.2	8	8	10	5,070	4,901	4,401	103.5	115.2
Argentina . . . . .	(2) 1,378	(2) 1,322	(2) 901	104.3	153.0	5,456	2,646	3,352	9,744	4,724	5,986	206.2	162.8
BARLEY													
Irish Free State . .	116	116	131	99.6	88.5	2,362	2,648	3,001	thous. bush. (48 pounds)				
Greece . . . . .	557	534	453	104.3	123.1	4,390	3,759	3,249	4,921	5,517	6,253	89.2	78.7
Hungary . . . . .	1,165	1,131	1,054	103.0	110.6	10,496	13,250	13,118	9,147	7,831	6,768	116.8	135.2
Netherlands . . . .	71	76	71	98.6	100.2	1,572	1,923	1,916	21,867	27,605	27,330	79.2	80.0
Cyprus . . . . .	94	123	116	78.3	80.8	599	1,189	1,072	3,274	4,017	3,992	81.5	82.0
French Morocco . .	3,222	3,207	3,028	100.5	106.4	23,136	17,995	19,953	1,248	2,477	2,234	50.4	55.9
Argentina . . . . .	1,439	1,422	1,171	101.2	122.8	10,620	6,834	7,961	58,619	37,491	41,560	156.4	141.0
Chile . . . . .	144	166	173	86.9	83.4	1,400	1,890	2,681	22,125	14,238	16,587	155.4	133.4
New Zealand . . . .	24	25	23	96.5	102.6	265	419	458	2,917	3,876	5,585	75.3	52.2
OATS													
Irish Free State . .	623	644	656	96.7	95.0	11,666	14,160	14,419	thous. bush. (32 pounds)				
Greece . . . . .	341	336	292	101.5	130.3	2,073	1,885	1,568	36,457	44,250	45,060	82.4	80.9
Hungary . . . . .	596	608	687	98.0	86.7	4,278	5,760	8,235	6,477	5,891	4,900	109.9	132.2
Netherlands . . . .	369	370	377	99.7	97.7	6,331	6,545	7,332	13,368	17,999	25,734	74.3	51.9
Portugal . . . . .	422	429	476	98.4	88.7	2,026	2,489	1,740	19,784	20,454	22,913	96.7	86.3
Cyprus . . . . .	13	11	14	114.4	90.8	61	78	88	6,831	7,778	5,436	81.4	116.5
French Morocco . .	60	103	71	58.4	84.7	531	754	529	190	245	276	77.7	69.0
Argentina . . . . .	3,470	3,937	3,387	88.1	102.5	22,170	15,873	21,278	1,660	2,357	1,652	70.4	100.5
Chile . . . . .	156	193	193	81.0	80.9	686	1,635	2,199	69,280	49,804	66,493	139.7	104.2
New Zealand . . . .	329	311	320	105.8	102.9	1,111	1,317	1,485	2,145	5,109	6,870	42.0	81.2
												84.4	74.9



COUNTRIES	(†) AREA					(†) PRODUCTION									
	1931	1930	Average 1925 to 1929	% 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32			
	—	—	—	1930	Aver.	—	—	—	—	—	—	1930	Aver.		
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	= 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	= 100		
	1,000 acres					1,000 centals			thous. bush. (56 pounds)						
POTATOES.															
Irish Free State . .	346	347	360	90.8	93.7	43,279	52,359	52,714	72,132	87,265	87,854	82.7	82.1		
Greece . . . . .	35	30	27	116.1	131.9	1,844	1,197	849	3,073	1,994	1,415	154.1	217.2		
Hungary . . . . .	701	673	652	104.2	107.5	31,912	40,597	43,333	53,185	67,660	72,221	78.6	73.6		
Netherlands . . . .	406	397	432	102.1	93.8	60,322	67,016	73,267	100,535	111,691	122,109	90.0	82.3		
Portugal . . . . .	72	66	54	109.1	131.0	13,330	12,454	6,089	22,216	20,756	11,147	107.0	190.3		
Cyprus . . . . .	6	5	8	107.6	75.3	451	401	345	751	669	575	112.3	130.6		
SUGAR-BEET.									thousand short tons						
Hungary . . . . .	134	183	168	73.1	79.8	21,301	32,210	32,047	1,065	1,610	1,647	66.1	64.7		
Netherlands . . . .	93	142	157	65.1	58.9	22,690	47,127	46,341	1,134	2,356	2,317	48.1	49.0		
Poland . . . . .	367	457	510	80.3	72.0	60,875	103,993	92,177	3,044	5,200	4,609	58.5	66.0		
VINES (WINE).						thous. Imperial gallons			thous. American gallons						
Greece . . . . .	356	304	277	117.0	128.3	(3) 35,724	(3) 48,603	(3) 56,958	(3) 42,902	(3) 58,368	(3) 68,401	73.5	62.7		
Cyprus . . . . .	118	112	89	105.4	132.2	1,917	3,867	4,750	2,302	4,644	5,704	49.6	40.4		
French Morocco . .	30	22	10	137.6	230.3	6,590	4,176	3,080	7,925	5,015	3,698	153.0	214.3		
Tunis . . . . .	98	98	74	113.1	135.5	15,602	21,097	18,898	18,809	26,417	22,694	71.2	82.9		
COTTON (GINNED)						1,000 centals									
Greece . . . . .	61	50	40	121.5	152.1	61	77	72	13	16	15	79.1	85.0		
Cyprus . . . . .	4	19	11	23.2	37.9	11	19	12	2	4	3	60.7	94.7		
Syria . . . . .	75	60	58	124.3	128.8	80	59	47	17	12	10	135.8	160.7		
Anglo-Egypt-Sudan	336	387	274	86.7	122.5	...	509	602	...	106	126	...	...		
Union of South Afr.	14	31	62	45.3	22.0	...	35	54	...	7	11	...	...		
FLAX									thousand pounds						
North-Ireland . . .	7	20	33	26.1	22.4	(b) 31	120	133	3,001	12,013	13,276	25.7	23.3		
Hungary . . . . .	44	36	7	122.3	601.1	(a) 174	191	31	thous. bush. (56 pounds)	310	341	55	90.9		
Netherlands . . . .	16	37	37	43.7	43.7	(a) 78	200	248	thousand pounds	(4) 73,688	(4) 86,013	—	84.8		
Cyprus . . . . .	3	1	2	191.5	171.2	(b) 16	9	9	thous. bush. (56 pounds)	139	358	443	38.9		
French Morocco . .	89	58	48	152.8	184.8	(b) 55	93	101	thousand pounds	9,918	22,957	25,346	43.2		
Argentina . . . . .	(2) 8,640	(2) 7,511	(2) 6,016	115.0	124.9	(b) 47,858	30,348	41,099	thous. bush. (56 pounds)	28	17	17	171.8		
HEMP									thousand pounds						
Hungary . . . . .	15	24	24	65.2	64.4	(a) 55	93	101	thous. bush. (56 pounds)	243	245	326	99.2		
Greece . . . . .	183	230	221	78.6	82.6	(b) (4) 528	(4) 927	—	thous. bush. (56 pounds)	932	448	408	208.1		
Hungary . . . . .	62	58	52	106.3	120.1	735	754	576	thous. bush. (56 pounds)	85,461	70,265	73,391	121.6		
HOPS									thousand pounds						
Germany . . . . .	25	32	36	78.4	70.5	(5) 172	244	161	(5) 17,152	24,866	16,111	70.4	106.5		
Belgium . . . . .	2	3	3	80.6	59.6	11	30	51	1,148	2,961	5,118	33.8	22.4		
Hungary . . . . .	1	1	(6)	98.7	162.4	3	3	2	274	308	170	89.0	161.1		
Yugoslavia . . . . .	6	8	15	70.5	36.6	35	39	72	3,499	3,873	7,229	90.3	48.4		

a) Seed. — b) Fibre. — (1) European crops only. — (2) Area sown. — (3) Must. — (4) Production expressed in dry stems (Straw). — (5) Including 34,500 centals that it was impossible to harvest. — (6) Area under 500 acres.

## TOTALS OF WORLD AGRICULTURAL PRODUCTION

The following totals have been obtained from the data in the tables published for each product in January, which have been revised and completed. With the name of each product is indicated the number of countries for which data for 1931 are at present available and also the percentage of their total production in 1930 to world production in the same year as published in the 1930-31 Yearbook, when they comprised nearly all producing countries.

Crop, number or countries comprised in the total, and percentages of world production	AREA				PRODUCTION								
	1931	1930	Average 1925 to 1929	Percentages for 1931 and 1931-32	BRITISH WEIGHTS			AMERICAN WEIGHTS			Percentages for 1931 and 1931-32		
	and	and	and	1930 and 1925-26 to 1931 = 100	Aver- age = 100	1931 and	1930 and	Average 1925 to 1929 and 1925-26 to 1929-30	1931 and	1930 and	Average 1925 to 1929 and 1925-26 to 1929-30	1930 and 1930- 1931 = 100	Aver- age = 100
	1931-32	1930-31	1925-26 to 1929-30			1931-32	1930-31		1931-32	1930-31		%	%
	thousand acres			%	%	thousand centals						%	%
Wheat (49 countr. 100.0 %) . . . a)	243,098	253,430	237,136	95.9	102.5	2,213,166	2,253,729	2,146,540	thousand bushels (60 pounds)			98.2	103.1
Rye (30 countries 100.0 %) . . . a)	46,281	49,049	47,396	94.4	97.6	460,880	557,835	525,771	thousand bushels (56 pounds)			82.6	87.7
Barley (42 countr. 90.0 %) . . . a)	39,215	62,469	57,057	94.8	103.8	589,042	698,621	641,871	thousand bushels (48 pounds)			84.9	91.8
Oats (37 countries 96.0 %) . . . a)	101,102	103,057	104,517	98.1	96.7	1,050,310	1,126,685	1,170,105	thousand bushels (32 pounds)			93.2	99.8
Maize (24 countries 72.0 %) . . . a)	146,072	140,209	138,514	104.2	105.5	1,875,665	1,564,750	1,944,083	thousand bushels (56 pounds)			119.9	96.5
Rice (rough) (15 countr. 90.0 %) a)	118,432	117,983	114,472	100.4	103.5	1,724,271	1,782,216	1,658,158	thousand bushels (45 pounds)			96.7	104.0
Potatoes (32 countr. 96.0 %) . . . a)	30,276	29,520	29,515	102.6	102.6	3,225,790	3,248,485	2,975,717	thousand bushels (60 pounds)			99.3	108.4
Sugar- beet { 19 countr. a) 20 countries 97.0 % b)	4,517	5,318	4,900	84.9	92.2	1,028,740	1,340,483	1,067,680	thousand short tons			70.2	96.4
	7,851	7,851	6,526	100.0	120.3	1,387,388	1,683,916	1,253,956	thousand bales (478 pounds net)			79.4	106.7
Cotton ginned (14 countr. 97.0 %) b)	72,368	77,763	78,141	98.1	92.6	113,860	108,618	113,699	thousand bushels (56 pounds)			104.8	100.1
Linseed (18 countr. 99.0 %) . . . a)	15,901	15,983	14,982	99.5	106.1	70,378	69,408	69,545	thousand bushels (56 pounds)			101.4	101.2
Flax (fibre) (12 countr. 72.0 %) a)	647	877	951	73.8	68.1	2,088	3,161	4,050	thousand pounds			66.0	51.6
Hemp (fibre) (7 countr. 57.0 %) a)	282	331	363	85.1	77.6	1,823	2,743	2,992	thousand pounds			66.5	60.9
Hemp seed (7 coun- tries 72.0 %) . .	292	351	381	83.1	76.6	714	704	862	thousand pounds			90.0	82.9
Tobacco (10 coun- tries 65.0 %) . a)	2,560	2,691	2,335	95.1	109.6	20,988	21,667	18,662	thousand American gallons			96.9	112.5
Hops (8 c. 94.0 %)	111	126	146	88.2	76.3	1,047	1,221	1,270	thousand Imperial gallons			85.7	82.5
Olive oil (6 countr. 95.0 %) . . . .	—	—	—	—	—	18,157	8,601	17,592	thousand American gallons			211.3	103.2
Vines (15 c. 83.0 %)	—	—	—	—	—	(1) 3,178,712 (2) 2,834,010 (3) 3,170,688	(1) 3,170,688	(1) 3,170,688	thousand pounds			112.2	100.3
Silk (5 c. 97.0 %) . .	(a) 7,699 (2) 7,453 (2) 7,411			90.8	91.3	(3) 880,404 (3) 1,037,887 (3) 898,318	(3) 898,318	(3) 898,318	thousand pounds			84.8	98.0

a) Not including the U. S. S. R. — b) Including the U. S. S. R. — (1) Wine. — (2) Eggs in incubation. — (3) Cocoons.

*Indo-China* : Picking has given good results in North Annam.

### Coffee.

*Guadeloupe* : The 1931-32 crop appears to be smaller than that of last year.

*Mexico* : The crop has been favoured by generally dry weather and yields vary from average to good. In the producing State of Vera Cruz, the quantities harvested have not been so large as the forecasts led to expect.

*Indochina* : The crop in Annam has been rather poor.

### Groundnuts.

*Argentina* : Crop condition in February was good and satisfactory yields were expected. The rains in the first half of February favoured the crop.

*Indochina* : The Cambodia crop, the area of which is increasing, is reported to be good.

*French West Africa* : An official report of 25 January indicates that, owing especially to the lack of rains before the harvest, this year's production will be greatly reduced ; though the first reports gave a figure above 11 million centals the actual amount will scarcely exceed 6.9 million centals, which means a very deficient crop.

### Colza, mustard and sesamum.

*Austria* : On 1 March crop condition of winter colza was 2.9 against 2.6 on 1 February 1932 and 2.8 on 1 March 1931.

*Hungary* : The final data of production of colza in 1931 are as follows : area harvested : 26,100 acres against 23,700 in 1930 and 29,800 on the average for 1925-29 (110.5 % and 87.6 %) ; production 221,000 centals (441,000 bushels) against 203,000 (407,000) in 1930 and 238,000 (475,000) on the average ; (108.5 % and 92.9 %).

*Greece* : Area in 1931 was 66,600 acres, a decrease of 11.4 % on that of last year (75,100 acres) and an increase of 63.2 % on the average of the five years ending 1929 (40,800 acres). Production in 1931 was 178,000 centals (8,900 short tons) an increase of 23.7 % on that of precedent year (144,000 centals, 11,200 short tons) and an increase of 109.5 % on the average of the five years ending 1929 (85,000 centals or 4,250 short tons).

*Netherlands* : The latest data of area and production of colza and mustard are as follows : colza, area 1931 : 4,950 acres ; 1930 : 5,540 ; average 1925-29 : 5,900 ; percentages : 89.4 and 84.1 ; mustard : 6,400 ; 3,600 and 7,300 acres respectively (190.4 % and 94.6 %) ; colza, production 1931 : 86,000 centals (172,000 bushels), 1930 : 114,000 (228,000) ; average 1925-29 : 124,000 (249,000) ; percentages : 75.3 and 69.0 ; mustard : 74,000, 44,000 and 89,000 centals respectively (168.2 % and 82.6 %).

*Cyprus* : The area under sesame in 1931 is estimated to have been 6,200 acres, as in 1930, against 2,900 acres, the average for the five-year period 1925 to 1929. Percentages : 99.6 and 214.5.

Production in 1931, was 9,500 centals (470 short tons) against 10,900 centals (540 short tons) in 1930 and 4,800 centals (240 short tons) on the average. Percentages: 87.2 and 196.0.

*India* : At the end of February the condition of standing crops in Bihar and Orissa was good. In Bengal at the beginning of March harvesting of early spring crops was progressing under favourable conditions and the state of standing crops was satisfactory. In the Punjab the weather continued mostly dry ; rats caused some damage in Gurgaon ; at the end of February conditions remained average to good on irrigated areas and below the average to average on unirrigated areas.

*Palestine* : At the end of February ploughing of sesamum was still in progress.

### Jute.

*India* : Up to February 24 light rain facilitated ploughing for jute in Bengal but on March 2, the need for more rain was reported.

## FODDER CROPS

*Austria* : On 1 March condition of the principal fodder crops was as follows: red clover 2.9 (against 2.8 on 1 February 1932 and 2.7 on 1 March 1931); alfalfa 2.9 (2.6, 2.8); mixed clover 2.6 (2.5, 2.4); mixture of fodder and vetches 2.9 (2.8, 2.7); permanent meadows 2.9 (2.6, 2.5); pasture 3.1 (2.8, 2.8).

*Belgium* : The clover and alfalfa fields look well.

*Irish Free State* : The weather during the greater part of February was exceptionally dry and pastures were brown and bare toward the end of the month.

*France* : The sharp frosts, severe cold and dry weather in the period from February 15 to mid-March were rather prejudicial to the meadows and pastures, to fodder sowings and other crops such as fodder cabbage and swedes.

On the contrary, the preparation of land for spring fodder sowings was generally effected under good conditions. At the middle of March, however, the need for copious rains to facilitate the last field operations and sowings was felt.

*Great Britain and Northern Ireland* : February was on the whole dry and mild but cold winds checked vegetation in the latter part of the month. In England and Wales the absence of severe frosts favoured the growth of seeds, which were reported to be generally strong and healthy. In Scotland pastures had an exceptionally fresh appearance, until growth was checked by the night frosts and rather colder conditions toward the end of the month.

The production of turnips and mangolds in Northern Ireland was as follows in comparison with that of previous years :

		1931	1930	Average 1925-29	Average 1930 = 100	Average 1925-29 = 100
		—	—	—	—	—
Turnips	(ooo centals) . . . . .	12,163	16,869	18,157	72.1	67.0
	(ooo sh. tons) . . . . .	608	843	908		
Mangolds	(ooo centals) . . . . .	282	471	464	59.9	60.8
	(ooo sh. tons) . . . . .	14	24	23		

*Hungary* : Severe frosts damaged clover meadows. At the end of the first decade of March permanent meadows had not yet recovered.

*Italy* : Fodder crops, which during the first half of February were on the whole insufficient for the needs of livestock, were damaged by the low temperatures in the latter half of the month and suffered in addition from the scarcity of rain.

In the following table are given the definitive data of area and of production in 1931 of fodder crops in terms of ordinary hay, compared with the final figures for 1930 :

CROPS		1931	1930	% 1931 1930 = 100	
Area (thousand acres).					
Temporary meadows	excluding those in 1st year of growth. . . . .	4,438	4,379	101.4	
	those in the 1st year of growth (new meadows). . . .	1,574	1,584	90.4	
	Total . . . . .	6,012	5,963	100.8	
Grass, mixed. . . . .		1,421	1,367	104.0	
Unirrigated permanent meadows . . . . .		3,338	3,400	98.2	
Irrigated permanent meadows . . . . .		857	850	100.9	
Permanent pastures . . . . .		11,194	11,251	90.5	
Production.					
Temporary meadows	excluding those in 1st year of growth (ooo centals)	194,285	242,240	80.2	
	(ooo sh. tons)	9,713	12,112		
	those in 1st year of growth (new meadows) (ooo centals)	15,366	25,276	60.8	
	(ooo sh. tons)	768	1,264		
Total . . . . .		209,651	267,516	78.4	
		(ooo sh. tons)	10,181	12,376	
Grass . . . . .	(ooo centals)	36,032	41,945	85.9	
		(ooo sh. tons)	1,802	2,097	
Unirrigated permanent meadows . . . . .	(ooo centals)	66,816	79,243	84.3	
		(ooo sh. tons)	3,311	3,962	
Irrigated permanent meadows . . . . .	(ooo centals)	50,695	56,569	89.6	
		(ooo sh. tons)	2,535	2,828	
Permanent pastures . . . . .	(ooo centals)	50,720	61,525	82.4	
		(ooo sh. tons)	2,536	3,076	
Accessory fodder production . . . . .	(ooo centals)	89,773	106,316	84.4	
		(ooo sh. tons)	4,489	5,316	

*Argentina* : The rains in the first half of February were very favourable to fodder crops, which had suffered from the drought in January.

*United States* : The warmer weather during the week ended on March 2, brought about some improvement in western and northwestern areas but, as in the areas where the snow melted pasture was poor, feeding of livestock was still necessary in most places. In the Southwest and East conditions were mostly satisfactory.

In the week ended on March 2 pastures were generally in good condition east of the Great Plains, the weather having favoured rapid growth. The warmer weather, with consequent opening of much range, brought a decided improvement over the western and more northwestern grazing sections but a considerable part of the uncovered range was in very poor condition.

*Palestine* : Growth of oats and vetches has been retarded but the crop is now developing strongly.

*Algeria* : Fodder crops generally look well. Cold weather in the High Plateaux has checked the growth of pastures, the recovery of which is slow in part nearly everywhere.

*Egypt*: The severe cold at the end of January and beginning of February caused dryness and discolouration of bersim crops, but the weather improved later on and greatly helped the plants to make up for the bad effect caused by the severe cold. The second cutting of bersim is proceeding. Crop condition on March 1 and February 1 was 100, as against 99 on March 1, 1931.

*French Morocco*: Thanks to abundant rainfall in February, pastures are greening.

## LIVESTOCK AND DERIVATIVES

### World trade in dairy products in 1931.

As in 1930, world trade in dairy products has encountered considerable difficulties in relation to the general economic situation. This situation has been expressed by the continual retrogressive movement of prices of butter, cheese and milk. The rise in prices in Great Britain and in some other countries subsequent to currency depreciation did not reflect the real state of the market. To illustrate the movement of prices some data may be taken for the Netherlands, which are near the principal markets and play an important part, not only as a butter and cheese exporting country but also as an exporter of milk (condensed milk, milk powder, etc.). The Central Bureau of Statistics of the Netherlands calculates the following percentage export prices:

	1928	1929	1930	1931
Butter . . . . .	100	97	80	66
Gouda cheese full cream . . . . .	100	96	85	73
"    "    40 + . . . . .	100	93	77	63
Edam cheese 40 + . . . . .	100	95	83	70
Full milk, condensed, sweetened . . . . .	100	95	89	78
Skim milk, condensed, sweetened . . . . .	100	90	81	73
Full milk powder . . . . .	100	95	85	73

The above figures show that butter prices last year fell to a particularly low level. For New Zealand butter the price paid on the London market in December was on the average 111/9 shillings per cwt., which is less than in December 1930 (115/1) despite the depreciation of sterling. On the contrary the price paid in December 1931 at London for New Zealand cheese was higher than at the corresponding period of the previous year, the respective prices being 67/5 and 65/6.

The reasons for the continual fall in prices of dairy products are fairly evident. With the increase in the number of livestock and the technical perfection of milk production and the dairy industry in general supply has constantly increased. On the other hand milk production last year was not often favoured by the weather, so that accumulation of stocks was restricted within certain limits. As the present low level of prices of dairy products has greatly reduced the profitableness of the dairy industry, the restriction of production in some countries appears to be a necessary consequence.

The fall in cereal prices, which brought about a restriction of cereal production last year, was in this way followed by a fall in the prices of dairy products to such a low level that the latter could no longer be said to retain the comparatively more favourable situation which they previously held.

The pressure of increased supply encountered, on the demand side, the generally known and increasing difficulties of marketing the product. These difficulties have

been further accentuated by the sterling crisis, which at first facilitated the export trade of countries whose currency followed the pound sterling, to the disadvantage of other countries but later led to the imposition of new restrictions on world exchange of commodities.

### I. — BUTTER.

Owing to the particularly heavy fall in butter prices demand has been maintained and, contrary to what has happened in the case of cheese, milk and other categories, international trade in butter has not diminished. *The butter export of the chief exporting countries* included in the following table was as a whole 5 % greater in 1931 than in the preceding year.

*Export of butter from the principal exporting countries \**  
(thousand pounds).

COUNTRIES	1931	1930	1929	1928
Denmark . . . . .	378,429	372,558	350,620	325,714
New Zealand . . . . .	221,083	211,047	185,226	162,351
Australia . . . . .	208,924	126,801	102,914	112,813
Netherlands . . . . .	72,660	92,394	104,325	103,488
Argentina . . . . .	47,948	51,150	37,547	44,183
Sweden . . . . .	43,162	58,806	54,961	38,080
Irish Free State . . . . .	42,307	58,767	62,797	62,623
Latvia . . . . .	41,313	40,631	32,695	23,673
Finland . . . . .	38,367	37,726	36,610	26,489
Estonia . . . . .	31,844	31,010	27,247	24,740
Poland . . . . .	27,470	26,714	33,248	24,194
Lithuania . . . . .	19,191	16,219	9,004	5,827
France . . . . .	11,036	12,095	16,722	24,837
Canada . . . . .	10,681	1,179	1,400	1,995
<b>TOTAL . . .</b>	<b>1,194,415</b>	<b>1,136,903</b>	<b>1,035,316</b>	<b>989,607</b>

(\*) Export from the U.S.S.R. during the first semestre in 1931 was 17,858 thousand pounds and in 1930 : 7,716 thousand pounds.

Amongst the exporting countries the three most important, Denmark, New Zealand and Australia were able in the past year to place greater quantities on the world market than in 1930, as also the countries of north-eastern and eastern Europe and Canada, which after an interval of four years again exported more butter than it imported. The increase in the Australian butter export has been especially large, while the Netherlands, the Irish Free State and Sweden experienced in 1931 very severe set-backs. The butter export of France has since 1928 steadily fallen off. The Soviet Union once more placed important quantities on the market in 1931, though official Russian data are still lacking. The most important markets for Soviet butter, the United Kingdom and Germany, took more than double the quantities of the preceding year in 1931, the former 45,290,000 the latter 16,841,000 pounds.

*The butter import of the principal importing countries* enumerated in the following table in 1931 was 5.6 % greater than in the preceding year. The increase in the import of Great Britain is especially large, much more so than in previous years. The import of France trebled in the past year, while that of Belgium also showed a relatively strong development. Germany and Canada, in opposition to the other leading importers, took much smaller quantities than in 1930. Canada's butter import in 1931 was, thanks to the marked growth of home production within the tariff wall, only very limited.

As regards the destination of the quantities marketed by the principal exporting coun-

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As regards the destination of the quantities marketed by the principal exporting coun-

*Import of butter in the principal importing countries*  
(thousand pounds).

COUNTRIES	1931	1930	1929	1928
Great Britain and Northern Ireland (1) . . .	864,610	744,870	702,748	666,228
Germany . . . . .	220,950	203,562	208,824	279,003
Belgium-Luxemburg . . . . .	41,562	22,414	9,550	2,890
France . . . . .	40,836	12,924	9,753	5,758
Switzerland . . . . .	23,358	18,797	16,619	18,063
Canada . . . . .	2,822	38,605	35,929	16,801
<b>TOTAL . . .</b>	<b>1,194,138</b>	<b>1,131,172</b>	<b>1,073,462</b>	<b>988,752</b>

(1) Re-exports have been deducted.

tries the British market is naturally of by far the greatest importance for Empire countries. The butter supply of the United Kingdom in recent years has been almost half accounted for by Empire countries. The relative share of these countries has increased, thanks above all to the increase in exports of Australia and New Zealand. Canada, after an interval, once more placed important quantities (8,106,000 pounds) on the British market. On the other hand, the export of the Irish Free State, which is practically entirely destined for the British market, suffered in the past year a severe setback. In 1931 Canada had a certain importance as a market for the particularly low-priced Australian butter, while New Zealand, in sharp opposition to what was formerly the case, was able to export scarcely any butter to that market. As a market for Australian butter the Netherlands Indies have also a certain importance. Of the Canadian butter export a relatively small part is marketed in the United States.

Of the butter-exporting countries not belonging to the British Empire, Argentina also exports almost exclusively to the United Kingdom; the quantity of Argentine butter sent to the latter country is decreased somewhat in 1931 and amounted to 41,992,000 pounds. Small but increasing quantities are exported from Argentina to France and Italy.

The principal European butter exporting countries (excluding the Irish Free State) have, besides Great Britain, other more or less important markets. Denmark, Sweden and Finland send their butter chiefly to the British market but largely also to Germany.

The export of Danish butter to the most important countries of destination is as follows in thousand pounds (the comparatively small quantities hermetically packed are excluded):

Year	United Kingdom	Germany	Belgium	Switzerland	France
1931 . . . . .	271,725	66,798	14,994	12,066	10,871
1930 . . . . .	254,679	91,704	8,772	8,953	5,154

Although the increase in exports of Danish butter to Great Britain has not been very large in comparison with that of Australia and of New Zealand, Denmark's share in 1931 is still nearly one-third, which is more than for any other country, of the total British butter imports.

Exports of butter from Finland to Great Britain in 1931 were rather larger than in the previous year and reached 28,455,000 pounds, British imports from Sweden, on the contrary, declined to 23,713,000 pounds. Sweden and Finland, like Denmark, gave had to diminish their exports of butter to Germany. The above figures show that Denmark has largely compensated for the smaller export to Germany by a larger

trade with Belgium, France and Switzerland. Due to the exchange situation Holland has not succeeded in doing this to the same extent.

The Dutch butter export to the most important countries of destination is as follows in thousands of pounds:

Year	Germany	Belgium	United Kingdom	France
1931 . . . . .	41,795	11,733	10,562	5,979
1930. . . . .	69,203	9,462	10,046	1,254

The above figures show that exports of butter from Holland to Germany have greatly declined. Holland, in 1931 participated in the German butter import trade to the extent of 16.2 %, and Denmark to the extent of 30.6 %.

The butter export trade of Poland and the Baltic countries (Estonia, Latvia and Lithuania) is, like that of Holland, mostly with Germany. The latter East-European countries last year also exported less to Germany. Latvia in 1931 placed 26,623,000 pounds on the German market, Poland 15,840,000, Estonia 13,724,000 and Lithuania 9,420,000. In the total German butter supply Latvia, after Denmark and the Netherlands, takes the largest share, of 12.1 %. Latvia's export to Great Britain decreased somewhat last year, as did also that of Poland; Estonia and Lithuania, on the contrary, disposed of larger quantities in the United Kingdom than in 1930. Switzerland and Belgium in 1931 became more important purchasers of butter from Poland and France and Belgium of butter from Latvia. The distribution of Russian butter exports has already been mentioned above. The French butter export trade is for the larger part of French butter to the colonies. Algeria in particular has developed a rather large and growing capacity for absorption.

## II. — CHEESE.

In contrast to the movement of the butter trade, the world cheese trade in 1931 shows a decline. This tendency was already indicated in 1930 by the falling export figures of that year. The total *cheese exports of the most important exporting countries* mentioned in the following table decreased by 1.4 % in 1930 and further in 1931 by 6.1 %.

*Export of cheese from the principal exporting countries*  
(thousand pounds).

COUNTRIES	1931	1930	1929	1928
Netherlands . . . . .	190,460	206,739	211,237	203,002
New Zealand . . . . .	181,891	203,053	199,259	175,535
Italy . . . . .	89,045	80,374	71,803	79,838
Canada . . . . .	84,790	80,105	92,945	114,151
Switzerland . . . . .	54,307	66,143	69,728	62,697
France . . . . .	33,259	38,923	40,609	41,813
Czechoslovakia . . . . .	10,981	8,274	7,053	7,921
Denmark . . . . .	9,423	12,626	14,513	13,417
TOTAL . . .	654,156	696,897	707,147	696,374

Of the two countries which place by far the largest quantities of cheese on the world market, the Netherlands and New Zealand, the latter, whose cheese was greatly underpriced on the London market last year, experienced a particularly large decrease in exports despite the low level of prices. For the consumption of the different kinds of

cheese the tendency of the consumer's tastes is evidently a very important factor even under conditions of limited purchasing power. The falling off in Dutch trade has also been considerable. Italy, on the contrary, as in 1930 was able to increase cheese exports to a not unimportant extent ; a rise was also noted last year in Canadian and Czechoslovakian exports. Prices of Canadian cheese, like those of the New Zealand product, have on the average in 1931, been at a comparatively low level. The price situation and movement of exports from New Zealand, have been especially unfavourable. The Swiss cheese export has shown a rather large decrease ; it has been declining, like that of Denmark, since 1929 while the French export has been restricted since 1928.

In the following table are given the *cheese exports of some of the less important countries* in this respect for the last two years ; the figures given for Great Britain do not include the quantities re-exported (1931 : 3,298,000 lbs., 1930 : 3,349,000 lbs.) :

*Thousand pounds.*

COUNTRIES	1931	1930	COUNTRIES	1931	1930
Australia . . . . .	7,405	7,266	Bulgaria . . . . .	3,133	2,465
Germany . . . . .	7,372	5,410	Poland . . . . .	2,884	3,207
Austria . . . . .	6,215	4,273	Norway . . . . .	2,840	1,380
Finland . . . . .	5,776	4,683	Lithuania . . . . .	2,546	1,900
Yugoslavia . . . . .	4,583	4,583	Albania . . . . .	...	3,104
Great Britain . . . . .	4,048	5,580			

If the above figures for the two years are compared it may be observed that the countries of this group in 1931 mostly succeeded in increasing their cheese exports ; exceptions are Yugoslavia, Great Britain and Poland ; no comparison can be made for Albania as the figure for 1931 is not available.

*World imports of cheese* showed a further increase in 1930, but in 1931 a decline was experienced in this trade also, amounting to 4.9 % for the principal importing countries shown in the following table. British imports of cheese were, as formerly, by far the most important, though a very heavy fall was recorded. The decline in German imports was relatively the greatest. The United States also greatly restricted their demand for foreign cheese. This applied also, though to a smaller extent, to Belgium. On the other hand France steadily increased its imports in the past year while its exports, as indicated above, declined.

*Import of cheese in the principal importing countries*

(thousand pounds).

COUNTRIES	1931	1930	1929	1928
Great Britain and Northern Ireland (1) . . .	319,795	345,243	331,744	333,181
Germany . . . . .	120,404	137,459	146,570	135,532
France . . . . .	82,810	65,524	51,070	43,685
United States . . . . . (2)	61,992	68,147	76,007	81,185
Belgium-Luxemburg . . . . .	49,600	51,108	46,456	39,026
TOTAL . . .	634,601	667,481	651,847	633,609

(1) Re-exports have been deducted. — (2) General import ; corresponding figure for 1930 : 68,313 thousand pounds.

Amongst the countries that require only small quantities of foreign cheese Italy, Egypt, Spain and Argentina decreased their imports in the past year ; Algeria, Switzer-

land, Austria, Greece, Czechoslovakia and the Irish Free State on the other hand showed an increase.

The principal foreign markets of the Netherlands were as follows, *cheese exports* being shown in thousand pounds *according to destination* :

Year	Germany	Belgium	France	United Kingdom	Spain	U.S.A.
1931 . . . . .	76,765	39,361	30,389	19,696	4,998	3,408
1930 . . . . .	86,895	41,952	28,385	21,186	6,638	3,362

The most important kinds of cheese exported from the Netherlands in 1931 were, as formerly, full-cream Gouda (31,121,000 lbs), 40 % Gouda (31,502,000 lbs.) and 40 % Edam (50,823,000 lbs). Gouda was bought particularly by Germany, Edam by France and the United Kingdom while in the export to Belgium both varieties figured almost equally.

The cheese export of New Zealand is almost exclusively destined for the British market ; very small quantities have in recent years gone to Canada. Canada also exports mainly to the United Kingdom, to which 80,566,000 lb. were shipped in 1931, a quantity exceeding that in the preceding year (74,261,000 lb). In 1931 it was able to market only 1,585,000 lbs. in the United States.

The Italian cheese export to the most important countries of destination was as follows (in thousand pounds) :

Year	United States	France	United Kingdom	Germany	Switzerland	Argentina
1931 . . . . .	32,448	27,018	13,325	5,637	3,455	919
1930 . . . . .	32,624	18,162	14,517	4,301	2,890	2,057

Especially noteworthy is the increase in exports to France and the smaller quantity sent to Argentina. Of the total Italian cheese export in 1931, 62.7 % consisted of hard cheeses and the remainder of soft cheeses. A very large proportion of the cheeses imported by the United States, Germany and Argentina from Italy are hard varieties whereas Great Britain and Switzerland take mostly soft varieties and France takes a little more soft than hard.

Switzerland exports almost exclusively hard cheeses ; in 1931 only 0.6 % of the total export consisted of soft varieties. The most important varieties are hard cheese in pieces and cheese in boxes ; in 1931 the former accounted for no less than 79.9 % and the latter 18.7 %. The remainder, representing only 0.8 % was Glarner green cheese.

The most important purchasers of Swiss cheese are the United States, France, Italy and Germany. The export of hard cheese in pieces to these countries in the last two years was as follows (in thousand pounds) :

Year	United States	France	Italy	Germany
1931 . . . . .	12,024	10,659	7,734	4,857
1930 . . . . .	16,078	7,445	9,588	10,629

After the above-named countries, Great Britain is the most important market for Swiss cheese. To this country, Switzerland exports predominantly cheese in boxes and

in fact more than to any other country (1931: 2,608,000 lb.; 1930: 3,040,000 lb). It should be mentioned that two other countries, Czechoslovakia and Belgium last year purchased comparatively large quantities, exceeding those of 1930, from Switzerland.

French cheese, like French butter, is largely exported to the Colonies. Algeria in 1931 imported 5,040,000 lbs semi-hard and similar cheeses, 4,140,000 lb. of soft cheeses and 961,000 lb. of Dutch or Gruyère cheese. The export to Algeria shows an increase, whereas that to both of the next most important purchasers, the United States and Belgium-Luxemburg, last year decreased. Total exports to the United States in 1931 amounted to 5,763,000 lb. of which 4,960,000 lb. consisted of the Rôquefort variety.

The Czechoslovakian cheese export is directed principally to Germany and Austria. The German market last year absorbed a greatly increased quantity of Czechoslovakian cheese whereas Austria took less. Denmark markets most of its surplus cheese in Germany and only small quantities in Great Britain and the United States. Danish cheese, in contrast to the cheap Czechoslovakian product, in 1931 arrived on the German market in smaller quantities.

Great Britain, which is the principal importing country, last year imported a rather larger proportion of cheese than previously from the Empire, in fact no less than 87 %; Germany, on the contrary, in 1931, as in 1930, took 62 % from the Netherlands.

E. P.

\* \* \*

### Condition of Livestock and Dairy Production.

*Austria* : Toward the end of February scarcity of fodder became increasingly accentuated. Many sales of livestock owing to lack of fodder are reported.

*Belgium* : Livestock are in good health.

*Irish Free State* : At the beginning of March ample stocks of hay, cereals and roots were on hand on most farms to meet all requirements during the remainder of the season. Milk yields in February were rather below average.

*Great Britain and Northern Ireland* : Demands upon winter keep have not been excessive and supplies are likely to be sufficient, though in Scotland wheat bran, malt culms and dried brewers' grains were scarce and dear in February; oats were cheap and were being used more generally for feeding dairy cows; supplies of roots are also generally plentiful. In England and Wales the milk yield was normal for the season save where hay of inferior quality was mainly used for fodder. In Scotland the yield of milk was slightly above the average for the season and in Northern Ireland generally normal.

In Northern Ireland the general condition of store cattle was very satisfactory and both outliers and stall-fed animals were thriving well; their health was also well maintained. Dairy cattle were in sound condition. All classes of sheep were in good condition and health; the mild weather was very favourable to lambing.

*Hungary* : At the end of the first decade of March a severe shortage of fodder was reported.

*Portugal* : Rains at the end of February improved the condition of the meadows and it is hoped that livestock will soon have plentiful feed.

*Argentina* : Winter reserves of feeding stuffs seem to be satisfactory. The livestock situation is generally good.

*Canada* : Data of production of concentrated milk products in 1931 compared with 1930 and 1929 are given in the following summary. Total production in 1931 was about 23 % smaller than in the previous year, nearly all the main products showing a large decrease.

*Production (in thousand lbs).*

	1931	1930	1929
Condensed milk . . . . .	14,806	21,887	25,482
Condensed skim milk . . . . .	4,209	8,553	10,492
Evaporated milk . . . . .	45,183	56,934	53,995
Evaporated skim milk . . . . .	265	365	—
Whole milk powder . . . . .	2,535	2,452	2,167
Skim milk powder . . . . .	13,253	16,001	12,788
Cream powder . . . . .	39	90	116
Buttermilk powder . . . . .	2,030	1,750	769
Condensed buttermilk . . . . .	1,529	947	441
Sugar of milk . . . . .	124	168	358
Malted milk . . . . .	438	...	...
Casein . . . . .	719	1,073	1,212
TOTAL . . . . .	85,132	110,214	107,820

*United States* : According to a report of February 27 published by the Department of Agriculture, production of wool in 1931 was 369,315,000 pounds against 351,521,000 in 1930 and 327,566,000 in 1929.

Production of mohair (including kid hair) in the United States in 1931 was 19,111,000 lbs compared with 17,303,000 in 1930 and 13,918,000 on the average for the period 1925-29; percentages: 110.4 and 137.3.

Preliminary figures of production in 1931 of some of the chief dairy products are given in the following summary :

*Production (in million lbs).*

	1931	1930	1929
Creamery butter . . . . .	1,626	1,595	1,597
Farm butter . . . . .	560	570	580
Cheese . . . . .	492	500	484
Condensed milk . . . . .	279	345	2,207
Evaporated milk . . . . .	1,675	1,735	

*Algeria* Livestock are in good health.

*French Morocco* : The condition of livestock is still rather unsatisfactory but the recovery in growth of the pastures justifies hopes of an improvement.

*Union of South Africa* : The more or less droughty conditions of December in the northern provinces and in the Natal Highveld and Bechuanaland continued until the end of January. Heavy rains and floods were, however, experienced in the south coast districts and Karroo areas of the Cape Province, and, apart from losses of animals, were of great benefit to stock. In the greater portion of the Orange Free State, of the Transvaal and of Natal grazing was generally short and in some cases had taken on the appearance of mid-winter. Heavy rains during the remainder of the season were required to establish grazing and winter feed and to replenish dams and springs. Sheep generally were in good condition but cattle had fallen off owing to the shortness of grazing. The blowfly menace had abated considerably.

### Livestock in New Zealand.

The returns of livestock for the Dominion as at 31 January, 1931 are now available and in the subjoined table are compared with those for the preceding five years and for 1911 and 1918.

#### *New Zealand.*

YEAR	Sheep (*) (including lambs)	Dairy Cows	Total Cattle	Pigs	Horses
1911	23,996,126	633,733	2,020,171	348,754	104,284
1918	26,538,302	793,212	2,869,465	258,694	378,050
1926	24,904,993	1,303,856	3,452,486	472,534	311,867
1927	25,649,016	1,303,225	3,257,729	520,143	303,713
1928	27,133,810	1,352,398	3,273,709	586,898	307,160
1929	29,051,382	1,371,063	3,445,700	556,732	298,986
1930	30,841,287	1,441,410	3,770,223	487,793	297,195
1931	29,792,516	1,601,633	4,080,525	476,194	295,743

(\*) As at 30 April.

The situation in the sheep industry has already been summarised in the "Crop Report" for February. It will be seen from the above table that the 1931 figure showed a decline in the total for sheep, though the figure was still above that of 1929. The increase in the number of cattle continued, a new record being reached. The advance in the number of dairy cows may be related to the steady improvement in grassland management and in breeding and to the fact that dairying is comparatively well suited to family farming in that its capital requirements are not so great as those for sheep-farming, while the monthly payments by the factories constitute a regular source of income to the small farmer. The dairy cows are mainly in Auckland, North Auckland, Taranaki and Wellington.

In the case of pigs the decline from the 1928 maximum continued and a further drop was recorded in the number of horses.



TRADE

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	421	0	0	0	3,306	827	0	0	3,294	0
Hungary . . . . .	273	260	0	0	0,403	3,752	0	0	5,217	0
Lithuania . . . . .	...	...	...	...	(2)	2 (2)	201 (2)	0 (2)	0	545
Rumania . . . . .	...	...	...	...	(2)	19,001 (2)	6,270 (2)	0 (2)	4	9,054
U. S. S. R. . . . .	...	...	...	...	(1)	22,919 (1)	14,617	—	—	67,735
Yugoslavia . . . . .	370	33	0	0	6,662	2,760	0	0	0	3,247
Canada . . . . .	5,684	5,765	2	9	62,671	82,980	49	33	137,150	70
United States . . . . .	2,445	774	761	801	30,402	26,841	4,458	6,790	46,229	11,610
Argentina . . . . .	176	6,279	—	—	25,210	16,405	—	—	71,553	—
Chile . . . . .	...	...	...	...	(2)	2 (2)	401 (2)	0 (2)	0	428
Turkey . . . . .	...	...	...	...	(2)	265 (2)	154 (2)	0 (2)	7	265
Algeria . . . . .	...	...	...	...	(2)	1,501 (2)	4,632 (2)	822 (2)	88	5,706
Tunis . . . . .	40	81	64	55	1,579	1,250	260	174	3,704	542
Australia . . . . .	10,333	9,822	0	0	26,636	23,634	0	0	76,505	0
<i>Importing Countries:</i>										
Germany . . . . .	631	46	1,581	1,162	6,018	236	8,814	9,612	265	18,805
Austria . . . . .	0	0	714	417	53	84	3,752	2,161	86	5,315
Belgium . . . . .	161	216	1,689	1,305	2,125	384	16,100	14,648	2,079	31,184
Denmark . . . . .	0	0	456	564	9	15	5,851	2,211	35	4,877
Spain . . . . .	0	0	0	0	0	4	35	0	4	0
Estonia . . . . .	0	0	13	20	0	0	152	267	0	370
Irish Free State . . . . .	7	0	304	518	7	18	3,311	3,640	18	6,485
Finland . . . . .	0	0	26	11	0	0	236	31	0	90
France . . . . .	0	0	1,755	2,762	9	944	22,117	17,561	966	46,606
Gr. Brit. and N. Ir. . . . .	18	84	5,758	8,203	258	408	74,552	67,847	683	124,551
Greece . . . . .	0	0	983	992	0	0	6,878	6,506	0	14,233
Italy . . . . .	0	0	1,093	3,501	18	22	1,475	24,249	18	50,116
Latvia . . . . .	...	...	...	...	(2)	0 (2)	6 (2)	245 (2)	562	0
Norway . . . . .	0	0	271	139	0	0	1,773	1,804	0	3,126
Netherlands . . . . .	46	171	1,605	2,273	77	216	8,442	9,718	683	16,568
Poland . . . . .	51	77	62	7	271	1,076	324	33	1,847	49
Portugal . . . . .	...	...	4	37	—	—	472	141	—	1,316
Sweden . . . . .	0	0	375	174	0	24	1,956	1,907	31	2,879
Switzerland . . . . .	2	0	983	1,013	4	0	7,513	6,307	2	11,096
Czechoslovakia . . . . .	0	0	809	46	2	2	7,416	4,531	4	7,079
British India . . . . .	11	60	0	584	157	1,880	179	1,900	2,251	6,087
Japan . . . . .	...	...	1,268	1,640	—	5,710	5,710	5,467	—	15,311
Syria and Lebanon . . . . .	...	...	...	...	(2)	302 (2)	95 (2)	7 (2)	33	137
Egypt . . . . .	0	0	68	152	0	2	243	505	2	1,019
Union of South Africa . . . . .	...	...	...	...	(2)	0 (2)	0 (2)	518 (2)	611	0
New Zealand . . . . .	...	...	...	...	(2)	0 (2)	0 (2)	53 (2)	64	0
<b>Totals . . . . .</b>	<b>27,669</b>	<b>23,621</b>	<b>20,644</b>	<b>26,505</b>	<b>217,069</b>	<b>190,233</b>	<b>186,722</b>	<b>189,634</b>	<b>439,713</b>	<b>384,139</b>
<b>Rye. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	159	37	328	88	1,962	1,182	2,202	406	1,212	690
Bulgaria . . . . .	64	37	0	0	882	637	0	0	1,413	0
Hungary . . . . .	38	216	0	0	807	1,067	0	0	1,579	0
Poland . . . . .	97	276	24	0	1,146	4,279	121	0	5,880	2
Rumania . . . . .	...	...	...	...	(2)	1,389 (2)	600 (2)	0 (2)	0	1,200
U. S. S. R. . . . .	...	...	...	...	(1)	4,409 (1)	2,132	—	—	15,794
Canada . . . . .	123	11	0	0	1,620	633	0	0	1,171	0
United States . . . . .	4	0	—	—	26	48	—	—	90	—
Argentina . . . . .	421	20	—	—	926	229	—	—	962	—
Turkey . . . . .	...	...	...	...	(2)	293 (2)	218 (2)	0 (2)	0	368
Algeria . . . . .	...	...	...	...	(2)	9 (2)	24 (2)	0 (2)	0	35
<i>Importing Countries:</i>										
Austria . . . . .	0	0	64	130	0	0	820	831	9	2,205
Belgium . . . . .	51	7	99	324	267	18	1,250	1,362	126	3,789
Denmark . . . . .	0	0	161	344	0	0	2,853	4,325	4	7,103
Estonia . . . . .	0	0	0	7	0	0	7	55	0	194
Finland . . . . .	0	0	31	18	0	0	315	1,210	2	1,570
France . . . . .	0	0	117	55	0	0	886	514	0	1,378
Italy . . . . .	0	0	7	31	0	0	62	237	0	597
Latvia . . . . .	...	...	...	...	(2)	0 (2)	0 (2)	51 (2)	146	0
Lithuania . . . . .	...	...	...	...	(2)	0 (2)	55 (2)	2 (2)	0	163
Norway . . . . .	0	0	282	359	0	0	2,072	1,642	0	3,023
Netherlands . . . . .	93	64	271	853	245	143	2,862	3,234	791	6,136
Sweden . . . . .	0	0	115	18	0	0	620	392	4	520
Switzerland . . . . .	0	0	2	9	0	0	49	105	0	174
Czechoslovakia . . . . .	0	37	243	2	4	399	3,898	112	476	844
<b>Totals . . . . .</b>	<b>1,945</b>	<b>705</b>	<b>1,744</b>	<b>2,238</b>	<b>13,897</b>	<b>11,671</b>	<b>17,557</b>	<b>14,674</b>	<b>31,409</b>	<b>28,485</b>

(2) (2) See notes page 214.

*Algeria* Livestock are in good health.

*French Morocco* : The condition of livestock is still rather unsatisfactory but the recovery in growth of the pastures justifies hopes of an improvement.

*Union of South Africa* : The more or less droughty conditions of December in the northern provinces and in the Natal Highveld and Bechuanaland continued until the end of January. Heavy rains and floods were, however, experienced in the south coast districts and Karroo areas of the Cape Province, and, apart from losses of animals, were of great benefit to stock. In the greater portion of the Orange Free State, of the Transvaal and of Natal grazing was generally short and in some cases had taken on the appearance of mid-winter. Heavy rains during the remainder of the season were required to establish grazing and winter feed and to replenish dams and springs. Sheep generally were in good condition but cattle had fallen off owing to the shortness of grazing. The blowfly menace had abated considerably.

### Livestock in New Zealand.

The returns of livestock for the Dominion as at 31 January, 1931 are now available and in the subjoined table are compared with those for the preceding five years and for 1911 and 1918.

#### *New Zealand.*

YEAR	Sheep (*) (including lambs)	Dairy Cows	Total Cattle	Pigs	Horses
1911	23,996,126	633,733	2,020,171	348,754	101,284
1918	26,538,302	793,212	2,809,465	258,604	378,050
1926	24,904,993	1,303,856	3,452,486	472,534	311,867
1927	25,640,016	1,303,225	3,257,729	520,143	303,713
1928	27,133,810	1,352,398	3,273,769	586,898	307,160
1929	29,051,382	1,371,063	3,445,790	556,732	298,986
1930	30,841,287	1,441,410	3,770,223	487,793	297,195
1931	29,792,516	1,601,633	4,080,525	476,191	295,743

(\*) As at 30 April.

The situation in the sheep industry has already been summarised in the "Crop Report" for February. It will be seen from the above table that the 1931 figure showed a decline in the total for sheep, though the figure was still above that of 1929. The increase in the number of cattle continued, a new record being reached. The advance in the number of dairy cows may be related to the steady improvement in grassland management and in breeding and to the fact that dairying is comparatively well suited to family farming in that its capital requirements are not so great as those for sheep-farming, while the monthly payments by the factories constitute a regular source of income to the small farmer. The dairy cows are mainly in Auckland, North Auckland, Taranaki and Wellington.

In the case of pigs the decline from the 1928 maximum continued and a further drop was recorded in the number of horses.

## TRADE

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	421	0	0	0	3,366	827	0	0	3,334	0
Hungary . . . . .	273	260	0	0	6,403	3,752	0	0	5,247	0
Lithuania . . . . .	...	...	...	...	(2)	2 (2)	201 (2)	0 (2)	0	545
Rumania . . . . .	...	...	...	...	(2)	19,061 (2)	6,270 (2)	0 (2)	9,054	9
U. S. S. R. . . . .	...	...	...	...	(1)	22,019 (1)	14,617	—	67,735	—
Yugoslavia . . . . .	370	33	0	0	6,662	2,700	0	0	3,247	0
Canada . . . . .	5,684	5,765	2	9	62,671	82,980	49	33	137,150	79
United States . . . . .	2,445	774	761	891	30,402	26,841	4,458	6,790	40,229	11,616
Argentina . . . . .	176	0,279	—	—	25,210	16,485	—	—	71,553	—
Chile . . . . .	...	...	...	...	(2)	2 (2)	401 (2)	0 (2)	428	0
Turkey . . . . .	...	...	...	...	(2)	265 (2)	154 (2)	0 (2)	205	7
Algeria . . . . .	...	...	...	...	(2)	1,501 (2)	4,632 (2)	822 (2)	5,706	1,371
Tunis . . . . .	40	31	64	55	1,579	1,250	260	174	3,704	542
Australia . . . . .	10,333	9,822	0	0	26,638	23,634	0	0	76,505	0
<i>Importing Countries:</i>										
Germany . . . . .	631	46	1,581	1,162	6,918	236	8,814	9,612	265	18,805
Austria . . . . .	0	0	714	417	53	84	3,752	2,161	86	5,315
Belgium . . . . .	161	216	1,689	1,305	2,125	384	16,100	14,648	2,079	31,184
Denmark . . . . .	0	0	466	564	9	15	5,851	2,211	35	4,877
Spain . . . . .	0	0	0	0	0	4	35	0	4	0
Estonia . . . . .	0	0	13	20	0	0	152	267	0	370
Irish Free State . . . . .	7	0	304	518	7	18	3,311	3,649	18	6,435
Finland . . . . .	0	0	26	11	0	0	236	31	0	90
France . . . . .	0	0	1,755	2,762	9	944	22,117	17,561	966	46,806
Gr. Brit. and N. Ir. . . . .	18	84	5,753	8,203	258	408	74,552	67,847	683	124,551
Greece . . . . .	0	0	993	992	0	0	6,878	6,506	0	14,233
Italy . . . . .	0	0	1,003	3,501	18	22	1,475	24,249	18	50,116
Latvia . . . . .	...	...	...	...	(2)	0 (2)	245 (2)	562	0	1,030
Norway . . . . .	0	0	271	139	0	0	1,773	1,894	0	3,126
Netherlands . . . . .	46	174	1,605	2,273	77	216	8,442	9,718	683	16,508
Poland . . . . .	51	77	62	7	271	1,076	324	33	1,847	49
Portugal . . . . .	—	—	1	37	—	—	472	141	—	1,216
Sweden . . . . .	0	0	375	174	0	24	1,956	1,907	31	2,879
Switzerland . . . . .	2	0	983	1,043	4	0	7,513	6,367	2	11,066
Czechoslovakia . . . . .	0	0	809	46	2	2	7,416	4,531	4	7,079
British India . . . . .	11	60	0	584	157	1,889	179	1,960	2,351	6,687
Japan . . . . .	—	—	1,208	1,640	—	—	5,710	5,467	—	15,311
Syria and Lebanon . . . . .	...	...	...	...	(2)	392 (2)	95 (2)	7 (2)	137	44
Egypt . . . . .	0	0	68	152	0	2	243	505	2	1,019
Union of South Africa . . . . .	...	...	...	...	(2)	0 (2)	0 (2)	518 (2)	611	1,601
New Zealand . . . . .	...	...	...	...	(2)	0 (2)	0 (2)	53 (2)	34	0
<b>Totals . . . . .</b>	<b>27,669</b>	<b>23,621</b>	<b>20,644</b>	<b>26,505</b>	<b>217,069</b>	<b>190,233</b>	<b>186,732</b>	<b>189,634</b>	<b>439,713</b>	<b>384,139</b>
<b>Rye. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	159	37	323	88	1,962	1,182	2,202	406	1,213	690
Bulgaria . . . . .	64	37	0	0	882	637	0	0	1,413	0
Hungary . . . . .	33	216	0	0	807	1,067	0	0	1,579	0
Poland . . . . .	97	276	24	0	1,146	4,279	121	0	5,880	2
Rumania . . . . .	...	...	...	...	(2)	1,389 (2)	600 (2)	0 (2)	1,299	0
U. S. S. R. . . . .	...	...	...	...	(1)	4,409 (1)	2,132	—	15,794	—
Canada . . . . .	123	11	0	0	1,620	633	0	0	1,171	0
United States . . . . .	4	0	—	—	29	46	—	—	90	—
Argentina . . . . .	421	20	—	—	926	229	—	—	992	—
Turkey . . . . .	...	...	...	...	(2)	203 (2)	218 (2)	0 (2)	363	0
Algeria . . . . .	...	...	...	...	(2)	0 (2)	24 (2)	0 (2)	35	0
<i>Importing Countries:</i>										
Austria . . . . .	0	0	64	130	0	9	820	831	9	2,205
Belgium . . . . .	51	7	99	324	267	18	1,250	1,362	126	3,739
Denmark . . . . .	0	0	161	344	0	—	2,853	4,325	4	7,103
Estonia . . . . .	0	0	0	7	0	0	7	55	0	194
Finland . . . . .	0	0	31	18	0	0	315	1,210	2	1,570
France . . . . .	0	0	117	55	0	0	886	514	0	1,878
Italy . . . . .	0	0	7	31	0	0	62	337	0	597
Latvia . . . . .	...	...	...	...	(2)	0 (2)	0 (2)	51 (2)	146	0
Lithuania . . . . .	...	...	...	...	(2)	0 (2)	55 (2)	2 (2)	0	163
Norway . . . . .	0	0	282	359	0	0	2,072	1,642	0	3,023
Netherlands . . . . .	93	64	271	853	245	143	2,352	3,234	791	6,186
Sweden . . . . .	0	0	115	18	0	0	620	392	4	690
Switzerland . . . . .	0	0	2	9	0	0	46	106	0	174
Czechoslovakia . . . . .	0	87	243	2	4	399	3,598	112	476	844
<b>Totals . . . . .</b>	<b>1,045</b>	<b>705</b>	<b>1,744</b>	<b>2,238</b>	<b>13,397</b>	<b>11,671</b>	<b>17,537</b>	<b>14,674</b>	<b>31,409</b>	<b>23,456</b>

(1) (2) See notes page 214.

COUNTRIES	JANUARY				SIX MONTHS (August 1- January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat flour. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	9	2	22	37	42	112	101	117	123	238
Belgium	4	15	2	18	35	95	37	134	216	231
Bulgaria	40	9	0	0	357	79	0	0	220	0
Spain	0	11	0	0	13	33	0	0	75	0
France	238	536	18	40	3,088	3,098	134	357	7,350	569
Hungary	97	187	0	0	1,470	2,822	0	0	4,008	0
Italy	187	104	20	11	1,254	670	163	88	1,179	225
Latvia	...	...	...	...	(2)	0 (2)	49 (2)	0 (2)	0	73
Lithuania	...	...	...	...	(2)	13 (2)	9 (2)	0 (2)	0	24
Poland	81	51	0	2	359	373	4	13	615	24
Rumania	...	...	...	...	(2)	419 (2)	251 (2)	0 (2)	0	421
Yugoslavia	2	7	0	0	53	71	0	2	84	2
Canada	650	769	4	4	5,677	7,743	22	20	13,113	49
United States	1,693	1,852	0	0	9,310	13,647	0	2	25,164	2
Argentina	73	209	—	—	657	1,056	—	—	2,044	—
Chile	...	...	...	...	(2)	7 (2)	82 (2)	0 (2)	0	104
India	60	86	0	0	463	553	0	2	1,032	2
Turkey	...	...	...	...	(2)	0 (2)	20 (2)	4 (2)	0	29
Japan	179	227	7	9	1,144	1,687	66	154	3,472	212
Algeria	...	...	...	...	(2)	44 (2)	185 (2)	37 (2)	18	267
Tunis	7	20	2	0	62	180	13	7	251	11
Australia	1,045	648	0	0	7,404	4,850	0	0	10,404	0
<i>Importing Countries:</i>										
Austria	0	0	99	102	7	2	600	1,217	13	3,100
Denmark	0	0	88	139	7	13	763	899	24	1,572
Estonia	0	0	0	7	9	0	13	62	2	83
Irish Free State	4	2	236	247	18	24	1,440	1,861	40	3,686
Finland	0	0	49	71	0	0	1,003	1,305	0	2,150
Gr. Britain and N. Ir.	381	316	683	785	2,624	2,394	5,990	6,865	4,608	12,816
Greece	0	0	2	7	0	0	49	90	0	165
Norway	0	0	64	31	7	2	825	701	2	1,396
Netherlands	2	15	46	370	40	66	441	2,081	115	3,845
Portugal	...	...	...	...	...	...	...	...	...	...
Sweden	0	0	4	2	0	2	86	75	—	213
Czechoslovakia	0	2	40	20	4	9	22	29	2	71
Ceylon	...	...	...	...	...	...	...	...	...	...
Java and Madura	...	...	...	...	...	...	...	...	...	...
Indo-China	...	...	...	...	...	...	(2)	534 (2)	384	1,025
Syria and Lebanon	...	...	29	46	...	...	...	...	...	...
Egypt	...	...	...	...	(2)	68 (2)	2 (2)	128 (2)	79	22
Union of South Africa	0	0	201	578	0	0	1,177	2,059	0	3,560
New Zealand	...	...	...	...	(2)	2 (2)	7 (2)	11 (2)	181	11
Totals	4,702	5,098	1,687	2,659	34,699	40,136	15,566	21,870	73,129	39,299
<b>Barley. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria	20	126	0	0	395	1,025	0	0	1,598	0
Spain	0	18	0	0	4	112	0	0	152	0
Hungary	0	77	0	0	44	467	0	0	580	4
Lithuania	...	...	...	...	(2)	0 (2)	7 (2)	0 (2)	0	15
Poland	223	282	0	0	2,328	2,141	0	0	2,798	0
Rumania	...	...	...	...	(2)	13,290 (2)	23,680 (2)	0 (2)	0	33,797
Czechoslovakia	68	152	0	0	922	2,762	2	2	3,003	4
U. S. S. R.	...	...	...	...	(1)	7,055 (1)	5,249	—	—	25,385
Canada	110	117	0	0	3,759	1,334	0	0	9,240	0
United States	53	315	—	—	1,889	2,862	—	—	5,022	—
Argentina	1,458	507	—	—	1,964	2,132	—	—	5,701	—
Chile	...	...	...	...	(2)	60 (2)	22 (2)	0 (2)	0	586
India	40	0	0	0	223	2	0	0	306	2
Syria and Lebanon	...	...	...	...	(2)	351 (2)	282 (2)	46 (2)	4	869
Turkey	...	...	...	...	(2)	1,534 (2)	119 (2)	0 (2)	0	598
Algeria	...	...	...	...	(2)	481 (2)	1,041 (2)	1,777 (2)	4	1,444
Egypt	0	0	18	7	0	2	286	46	2	152
Tunis	2	2	20	58	121	157	487	207	220	390
Australia	364	223	0	0	672	681	0	0	1,552	0
<i>Importing Countries:</i>										
Germany	2	0	1,259	2,617	11	60	6,907	9,489	62	17,906
Austria	0	0	170	132	0	0	1,345	1,080	0	2,077
Belgium	152	148	871	1,067	836	205	5,378	5,701	1,078	10,888
Denmark	36	172	55	1,661	348	754	2,114	9,145	1,232	15,007
Estonia	0	0	0	0	0	0	0	18	0	13
Irish Free State	0	0	172	11	22	20	281	20	20	454
France	0	2	800	694	11	13	5,307	3,631	22	7,721
Gr. Britain and N. Ir.	2	7	664	1,929	9	18	10,009	12,652	68	19,691
Greece	0	0	11	11	0	0	18	62	0	79
Italy	0	0	55	68	0	0	392	421	0	778
Latvia	...	...	...	...	(2)	0 (2)	0 (2)	4 (2)	121	0
Norway	0	0	24	216	0	0	478	650	0	1,678
Netherlands	24	73	646	1,559	187	201	5,512	8,327	591	14,716
Switzerland	0	0	276	359	0	0	1,825	1,541	0	2,329
Yugoslavia	2	0	0	20	18	11	88	121	29	130
Totals	2,601	2,221	5,041	10,394	35,979	45,238	42,401	53,537	99,913	49,299

(x) (a) See notes page 224.

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Oats. — Thousand cents (1 cental = 100 lbs.).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	2	2	2	79	7	205	172	185	220	1,005
Irish Free State . . . . .	4	20	15	13	49	181	152	128	254	452
Hungary . . . . .	0	2	0	22	2	11	2	29	13	141
Lithuania . . . . .	...	...	...	...	(2)	2 (2)	51 (2)	0 (2)	0	84
Poland . . . . .	2	7	0	0	18	90	0	0	137	0
Rumania . . . . .	...	...	...	...	(2)	260 (2)	1,155 (2)	0 (2)	0	1,779
Czechoslovakia . . . . .	66	73	0	0	300	677	53	4	710	143
U. S. S. R. . . . .	...	...	...	...	...	...	...	...	10,726	...
Yugoslavia . . . . .	0	0	0	0	...	0	...	73	2	86
Canada . . . . .	403	88	0	0	2,145	690	536	229	2,669	234
United States . . . . .	18	9	4	88	635	79	7	110	130	195
Argentina . . . . .	1,863	1,127	...	...	0,069	5,717	...	...	14,621	...
Chile . . . . .	...	...	...	...	(2)	104 (2)	862 (2)	0 (2)	0	2,178
Algeria . . . . .	...	...	...	...	(2)	84 (2)	642 (2)	276 (2)	108	1,292
Tunis . . . . .	4	13	0	0	126	359	0	9	545	9
<i>Importing Countries:</i>										
Austria . . . . .	0	0	126	141	0	2	736	906	2	2,227
Belgium . . . . .	0	0	64	220	2	2	518	1,911	4	3,494
Denmark . . . . .	0	4	33	77	44	7	284	434	20	1,270
Estonia . . . . .	0	0	0	2	0	0	7	29	0	159
Finland . . . . .	2	2	0	2	13	4	40	60	7	280
France . . . . .	0	2	112	84	4	9	655	1,010	20	2,213
Gr. Brit. and N. Irel. . . . .	0	0	205	798	37	37	4,030	5,443	397	10,697
Italy . . . . .	0	0	320	480	0	0	1,750	2,284	0	3,741
Latvia . . . . .	...	...	...	...	(2)	0 (2)	0 (2)	7 (2)	13	4
Norway . . . . .	0	0	7	0	0	0	130	0	4	4
Netherlands . . . . .	4	9	172	271	29	31	1,067	1,748	375	3,609
Sweden . . . . .	4	4	31	68	7	15	659	498	40	1,334
Switzerland . . . . .	0	0	208	509	0	0	2,346	2,416	2	4,594
Australia . . . . .	9	11	0	0	33	42	0	0	73	2
<b>Totals . . . . .</b>	<b>2,399</b>	<b>1,391</b>	<b>1,449</b>	<b>2,663</b>	<b>9,979</b>	<b>10,868</b>	<b>13,436</b>	<b>17,627</b>	<b>36,298</b>	<b>36,124</b>

**Maize. — Thousand cents (1 cental = 100 lbs.).**

COUNTRIES					THREE MONTHS (November 1-January 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<i>Exporting Countries:</i>										
Bulgaria . . . . .	410	254	0	0	710	1,041	0	0	3,477	0
Rumania . . . . .	...	...	...	...	(2)	8,197 (2)	4,059 (2)	0 (2)	13,700	2
Yugoslavia . . . . .	342	602	2	0	721	2,447	18	7	6,420	24
United States . . . . .	68	71	24	75	355	159	84	304	1,336	520
Argentina . . . . .	10,706	12,747	...	...	52,338	35,814	...	...	198,617	...
Brazil . . . . .	...	...	...	...	(2)	0 (2)	0	...	18	...
Java and Madura . . . . .	...	...	...	...	(2)	123 (2)	33	...	2,407	...
Indo-China . . . . .	370	176	...	...	1,228	1,495	...	...	2,584	...
Syria and Lebanon . . . . .	...	...	...	...	(2)	4 (2)	26 (2)	4 (2)	159	49
Egypt . . . . .	2	2	2	2	2	2	13	18	4	298
Union of South Africa . . . . .	...	...	...	...	(2)	1,241 (2)	972 (2)	0 (2)	3,298	0
<i>Importing Countries:</i>										
Germany . . . . .	0	0	1,129	880	0	0	3,210	1,786	0	10,007
Austria . . . . .	0	0	783	417	0	0	2,176	1,202	2	6,270
Belgium . . . . .	66	62	2,436	1,369	152	108	6,096	3,667	955	17,075
Denmark . . . . .	0	0	2,379	959	0	0	5,977	2,150	0	13,589
Spain . . . . .	0	0	305	260	0	0	1,025	758	0	3,868
Irish Free State . . . . .	0	0	1,360	657	0	0	3,300	2,094	26	12,044
Finland . . . . .	0	0	2	22	0	0	108	51	0	355
France . . . . .	2	4	2,273	1,537	4	15	6,537	6,124	40	23,755
Gr. Brit. and N. Ir. . . . .	229	190	6,715	5,344	739	580	22,075	14,317	2,407	53,281
Greece . . . . .	0	0	425	0	0	0	492	22	0	878
Hungary . . . . .	7	42	75	60	44	161	132	154	240	2,337
Italy . . . . .	0	0	1,221	844	0	2	3,069	3,865	7	17,447
Norway . . . . .	0	0	373	212	0	0	1,393	807	0	8,977
Netherlands . . . . .	22	44	5,430	3,393	40	115	13,098	8,869	279	92,441
Poland . . . . .	0	0	15	18	0	0	61	77	0	496
Portugal . . . . .	...	...	37	106	...	...	300	730	...	1,505
Sweden . . . . .	0	0	589	467	0	0	1,931	1,862	0	7,511
Switzerland . . . . .	0	0	298	291	...	...	1,168	96	2	3,611
Czechoslovakia . . . . .	0	0	873	809	0	0	4,109	2,255	2	13,115
Canada . . . . .	0	0	106	392	...	...	1,885	1,519	9	4,790
Japan . . . . .	...	...	170	106	...	...	598	302	...	1,689
Tunis . . . . .	0	0	40	40	0	0	168	110	9	289
<b>Totals . . . . .</b>	<b>12,233</b>	<b>14,194</b>	<b>27,152</b>	<b>18,269</b>	<b>63,906</b>	<b>47,042</b>	<b>75,957</b>	<b>53,488</b>	<b>240,992</b>	<b>234,345</b>

[2 See notes page 214.

COUNTRIES	JANUARY				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931	1930	1931	1930	1930	1930
<b>Rice. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Spain . . . . .	55	33	0	0	833	1,252	0	0	—	—
Italy . . . . .	417	412	7	0	3,111	4,716	53	134	—	—
United States . . . . .	130	379	33	44	2,771	2,615	328	203	—	—
Brazil . . . . .	—	—	—	—	1,993	844	—	—	—	—
India . . . . .	3,843	3,329	55	9	48,375	58,238	692	141	—	—
Indo-China . . . . .	1,839	1,182	—	—	21,017	21,998	—	—	—	—
Siam . . . . .	2,030	2,163	—	—	24,758	20,598	—	—	—	—
Egypt . . . . .	22	119	11	4	686	1,200	836	251	—	—
<i>Importing Countries:</i>										
Germany . . . . .	84	80	419	231	1,373	1,594	8,962	5,465	—	—
Austria . . . . .	0	0	37	55	0	0	756	606	—	—
Belgium . . . . .	20	13	82	37	190	0	1,349	1,047	—	—
Denmark . . . . .	0	0	7	13	0	0	157	139	—	—
Estonia . . . . .	—	—	2	2	—	—	23	35	—	—
Irish Free State . . . . .	0	0	4	4	0	0	53	46	—	—
France . . . . .	62	73	443	351	937	1,903	6,792	5,650	—	—
Gr. Brit. and N. Irel. . . . .	20	15	117	128	271	218	2,690	2,562	—	—
Greece . . . . .	—	—	42	46	—	—	540	536	—	—
Hungary . . . . .	0	0	10	31	2	9	481	388	—	—
Latvia . . . . .	—	—	—	—	0	7	82	62	—	—
Lithuania . . . . .	—	—	—	—	0	0	22	31	—	—
Norway . . . . .	0	0	7	11	0	0	117	101	—	—
Netherlands . . . . .	112	132	53	247	2,480	2,035	4,963	3,563	—	—
Poland . . . . .	20	9	2	0	606	126	1,726	1,177	—	—
Portugal . . . . .	—	—	31	22	—	—	613	941	—	—
Sweden . . . . .	—	—	0	0	—	—	123	161	—	—
Switzerland . . . . .	0	0	90	44	0	0	454	408	—	—
Czechoslovakia . . . . .	0	0	99	44	0	0	1,127	979	—	—
Yugoslavia . . . . .	0	0	37	40	4	2	511	516	—	—
Canada . . . . .	0	0	40	71	0	0	710	584	—	—
Chile . . . . .	—	—	—	—	—	—	492	518	—	—
Ceylon . . . . .	0	2	1,910	952	18	9	10,196	10,809	—	—
Java and Madura . . . . .	—	—	—	—	232	117	5,886	5,185	—	—
Japan . . . . .	4	320	236	101	4,105	1,257	2,773	3,973	—	—
Syria and Lebanon . . . . .	—	—	—	—	0	2	322	320	—	—
Turkey . . . . .	—	—	—	—	0	0	183	196	—	—
Algeria . . . . .	—	—	—	—	(3)	2 (3)	134 (3)	90	—	—
Tunis . . . . .	0	0	4	2	0	0	31	24	—	—
Union of S. Africa . . . . .	—	—	—	—	0	0	1,025	930	—	—
Australia . . . . .	13	11	4	4	161	71	29	75	—	—
New Zealand . . . . .	—	—	—	—	0	0	73	66	—	—
Totals . . . . .	8,700	8,232	2,992	2,493	114,215	118,533	55,314	48,392	—	—
<b>Linseed. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Estonia . . . . .	0	0	0	0	4	55	0	2	—	—
Lithuania . . . . .	—	—	—	—	247	443	0	0	—	—
Argentina . . . . .	4,628	5,007	—	—	41,346	25,486	—	—	—	—
India . . . . .	192	110	0	0	2,515	5,855	0	0	—	—
Tunis . . . . .	0	0	0	0	4	9	0	0	—	—
<i>Importing Countries:</i>										
Germany . . . . .	2	0	470	500	13	26	7,507	5,194	—	—
Belgium . . . . .	64	7	282	260	203	68	3,702	1,976	—	—
Denmark . . . . .	—	—	33	29	—	—	417	359	—	—
Spain . . . . .	—	—	18	20	—	—	465	419	—	—
Finland . . . . .	0	0	0	11	0	0	68	79	—	—
France . . . . .	0	2	258	214	18	15	5,814	4,288	—	—
Gr. Brit. and N. Irel. . . . .	0	0	368	452	4	9	7,590	5,002	—	—
Greece . . . . .	0	0	2	4	0	2	95	64	—	—
Hungary . . . . .	0	0	0	0	42	143	2	106	—	—
Italy . . . . .	0	0	95	77	0	0	1,351	1,175	—	—
Latvia . . . . .	—	—	—	—	106	236	90	170	—	—
Norway . . . . .	0	0	18	33	0	0	289	357	—	—
Netherlands . . . . .	46	4	1,016	470	49	146	9,253	5,617	—	—
Poland . . . . .	0	2	7	4	7	31	273	150	—	—
Sweden . . . . .	—	—	33	9	—	—	1,056	798	—	—
Czechoslovakia . . . . .	0	0	31	13	7	18	582	445	—	—
Yugoslavia . . . . .	0	0	0	4	0	2	126	121	—	—
Canada . . . . .	0	0	0	0	584	783	194	454	—	—
United States . . . . .	—	—	403	196	—	—	8,109	7,090	—	—
Japan . . . . .	—	—	33	9	—	—	185	126	—	—
Australia . . . . .	0	0	26	13	0	0	291	340	—	—
Totals . . . . .	4,932	5,132	3,093	3,327	45,151	33,307	47,468	34,032	—	—

(2) (3) See notes page 214.

COUNTRIES	JANUARY				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931	1930	1931	1930	1930	1930
<b>Butter. — (Thousand lbs.)</b>										
<i>Exporting Countries:</i>										
Austria . . . . .	101	448	2	2	2,862	4,112	1,565	545	—	—
Denmark . . . . .	20,108	31,072	192	9	378,420	372,558	1,596	1,389	—	—
Estonia . . . . .	1,135	1,448	0	0	31,844	31,010	0	0	—	—
Irish Free State . . . . .	212	364	203	439	42,307	58,815	3,325	3,391	—	—
Finland . . . . .	3,228	3,267	0	0	38,867	37,726	0	7	—	—
France . . . . .	822	761	99	2,085	11,036	12,106	40,836	12,921	—	—
Hungary . . . . .	425	284	0	0	4,065	3,430	117	40	—	—
Latvia . . . . .	—	—	—	—	41,313	40,031	24	49	—	—
Lithuania . . . . .	—	—	—	—	19,191	16,219	0	0	—	—
Netherlands . . . . .	2,337	5,022	2,760	933	72,060	92,394	8,887	4,306	—	—
Poland . . . . .	908	1,676	0	2	27,470	26,714	31	29	—	—
Sweden . . . . .	3,210	4,451	7	0	43,162	58,857	40	18	—	—
U. S. S. R. . . . .	—	—	—	—	(4) 18,052	(4) 7,677	—	—	—	—
Argentina . . . . .	7,824	8,040	—	—	47,948	51,156	—	—	—	—
India . . . . .	35	57	53	29	364	551	344	282	—	—
Syria and Lebanon . . . . .	—	—	—	—	1,817	2,161	344	172	—	—
Australia . . . . .	30,640	19,313	0	0	208,924	126,411	0	2	—	—
New Zealand . . . . .	14,562	25,922	—	—	220,814	208,170	—	—	—	—
<i>Importing Countries:</i>										
Germany . . . . .	4	20	18,051	17,110	269	575	220,950	293,560	—	—
Belgium . . . . .	68	198	5,303	3,865	2,750	2,648	41,562	22,633	—	—
Spain . . . . .	2	0	4	2	88	161	121	328	—	—
Gr. Brit. and N. Irel. . . . .	8,521	4,176	79,653	75,615	40,228	20,514	903,967	764,019	—	—
Greece . . . . .	—	—	134	110	—	—	2,059	1,420	—	—
Italy . . . . .	31	40	902	765	1,290	1,843	6,138	3,115	—	—
Norway . . . . .	439	90	4	26	1,629	236	379	1,530	—	—
Switzerland . . . . .	0	0	1,129	1,520	20	40	23,358	18,794	—	—
Czechoslovakia . . . . .	21	132	44	15	661	694	4,107	714	—	—
Canada . . . . .	112	66	18	418	10,691	1,179	2,822	38,005	—	—
United States . . . . .	141	225	123	110	2,004	2,907	1,883	2,471	—	—
Ceylon . . . . .	—	—	55	60	—	—	642	723	—	—
Java and Madura . . . . .	—	—	—	—	—	—	8,514	7,557	—	—
Japan . . . . .	—	—	20	40	—	—	231	611	—	—
Algeria . . . . .	—	—	—	—	(3) 66	(3) 73	(3) 4,237	(3) 3,040	—	—
Egypt . . . . .	79	0	99	287	77	42	2,041	2,416	—	—
Tunis . . . . .	0	0	93	82	9	13	930	829	—	—
<b>Totals</b> . . . . .	<b>103,968</b>	<b>107,660</b>	<b>109,938</b>	<b>104,490</b>	<b>1,270,403</b>	<b>1,181,683</b>	<b>1,281,100</b>	<b>1,185,606</b>	—	—
<b>Cheese. — (Thousand lbs.)</b>										
<i>Exporting Countries:</i>										
Denmark . . . . .	944	743	31	64	9,423	12,626	604	809	—	—
Finland . . . . .	589	622	0	2	5,776	4,083	83	35	—	—
Italy . . . . .	4,067	4,806	414	525	89,045	80,976	10,115	12,562	—	—
Lithuania . . . . .	—	—	—	—	2,546	1,960	11	11	—	—
Norway . . . . .	322	117	20	40	2,840	1,380	562	750	—	—
Netherlands . . . . .	12,070	14,861	82	110	100,460	206,739	1,345	1,510	—	—
Poland . . . . .	218	216	31	60	2,884	3,267	761	1,974	—	—
Switzerland . . . . .	3,089	4,457	501	452	54,307	66,143	8,470	4,237	—	—
Czechoslovakia . . . . .	1,171	948	218	163	10,981	8,274	3,779	2,963	—	—
Yugoslavia . . . . .	278	29	13	15	4,198	4,583	243	300	—	—
Canada . . . . .	752	917	71	84	84,700	66,955	1,446	1,779	—	—
Australia . . . . .	1,373	527	0	2	7,405	7,273	24	150	—	—
New Zealand . . . . .	23,515	20,496	0	0	181,703	201,256	4	4	—	—
<i>Importing Countries:</i>										
Germany . . . . .	247	509	7,639	9,471	7,372	5,410	120,404	137,459	—	—
Austria . . . . .	66	425	267	313	6,213	4,480	5,192	5,637	—	—
Belgium . . . . .	49	60	3,600	4,317	814	875	49,600	51,106	—	—
Spain . . . . .	7	13	132	168	236	207	3,867	5,836	—	—
Irish Free State . . . . .	20	13	172	262	194	104	2,687	2,350	—	—
France . . . . .	2,017	2,926	2,136	5,492	38,259	38,921	82,810	65,519	—	—
Gr. Brit. and N. Irel. . . . .	580	677	27,210	26,134	7,346	8,931	323,001	348,578	—	—
Greece . . . . .	0	4	324	196	190	302	3,960	2,802	—	—
Hungary . . . . .	4	11	7	37	110	93	203	886	—	—
Portugal . . . . .	—	—	13	24	—	—	842	1,010	—	—
Sweden . . . . .	—	—	64	77	—	—	1,691	1,470	—	—
United States . . . . .	179	196	3,780	4,123	1,865	2,127	61,992	68,813	—	—
India . . . . .	0	0	79	132	7	7	886	1,133	—	—
Java and Madura . . . . .	—	—	—	—	—	—	1,658	1,671	—	—
Syria and Lebanon . . . . .	—	—	—	—	86	132	708	730	—	—
Algeria . . . . .	—	—	—	—	196	212	11,182	10,897	—	—
Egypt . . . . .	37	11	231	686	78	64	7,335	7,538	—	—
Tunis . . . . .	0	0	183	196	24	29	2,033	1,746	—	—
<b>Totals</b> . . . . .	<b>53,379</b>	<b>53,282</b>	<b>47,357</b>	<b>53,145</b>	<b>704,343</b>	<b>723,099</b>	<b>708,138</b>	<b>739,360</b>	—	—

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1930	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Cotton. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
United States. . . . .	4,938	2,859	64	57	26,557	24,112	194	152	30,391	538
Argentina. . . . .	2	4	—	—	251	220	—	—	511	—
Brazil. . . . .	—	—	—	—	(2) 174	(2) 231	—	—	516	—
India. . . . .	672	1,755	115	245	3,053	7,136	425	615	14,881	1,870
Egypt. . . . .	767	648	0	0	4,198	3,408	0	0	6,000	0
<i>Importing Countries:</i>										
Germany. . . . .	163	117	992	853	950	915	4,220	1,908	1,706	8,442
Austria. . . . .	0	0	55	40	0	0	208	247	0	467
Belgium. . . . .	26	18	141	130	190	71	825	785	201	1,713
Denmark. . . . .	—	—	9	11	—	—	66	71	—	154
Spain. . . . .	2	2	247	207	11	11	899	970	24	2,253
Estonia. . . . .	0	0	9	13	0	0	35	44	0	84
Finland. . . . .	0	0	7	13	0	0	79	97	0	172
France. . . . .	40	44	454	849	304	289	1,720	4,742	549	8,131
Gr. Brit. and N. Irel.	33	29	1,166	1,113	196	260	0,508	6,521	481	10,959
Greece. . . . .	0	0	18	15	0	0	110	104	0	225
Hungary. . . . .	—	—	26	22	—	—	163	148	—	201
Italy. . . . .	0	0	463	430	0	2	1,830	1,859	2	3,821
Latvia. . . . .	—	—	—	—	(2) 0	(2) 0	(2) 33	(2) 37	0	62
Norway. . . . .	—	—	7	7	—	—	24	31	—	46
Netherlands. . . . .	0	0	75	132	7	2	494	529	7	1,043
Poland. . . . .	2	2	84	84	13	11	569	791	24	1,444
Portugal. . . . .	—	—	33	11	—	—	190	174	—	333
Sweden. . . . .	—	—	40	37	—	—	302	249	—	467
Switzerland. . . . .	0	0	53	73	4	0	276	302	7	608
Czechoslovakia. . . . .	11	11	150	104	75	84	1,089	1,279	154	2,308
Yugoslavia. . . . .	0	0	22	15	0	0	108	95	0	185
Canada. . . . .	—	—	66	104	—	—	522	611	—	1,025
Japan. . . . .	53	31	1,601	1,230	392	276	5,853	5,404	534	13,741
Algeria. . . . .	—	—	—	—	(2) 0	(2) 2	(2) 0	(2) 0	24	4
<b>Totals. . . . .</b>	<b>6,769</b>	<b>5,520</b>	<b>5,897</b>	<b>5,879</b>	<b>37,775</b>	<b>37,030</b>	<b>26,534</b>	<b>30,665</b>	<b>62,681</b>	<b>60,452</b>

**Wool. — (Thousand lbs).**

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1930	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wool. — (Thousand lbs).</b>										
<i>Exporting Countries:</i>										
Spain. . . . .	243	86	311	532	1,265	2,500	1,246	1,907	3,040	10,474
Irish Free State. . . . .	520	368	46	60	5,633	2,596	375	271	7,965	752
Hungary. . . . .	46	117	115	276	1,164	1,250	670	838	6,931	1,012
Argentina. . . . . (a)	20,579	35,455	—	—	80,129	98,401	—	—	287,424	—
Chile. . . . . (b)	—	342	—	—	—	1,304	—	—	4,206	—
India. . . . .	3,382	2,608	406	134	(2) 1,900	(2) 1,230	—	—	28,455	—
Syria and Lebanon. . . . .	—	—	—	—	(2) 1,854	(2) 3,766	(2) 366	(2) 1,607	41,800	4,857
Algeria. . . . .	—	—	—	—	(3) 1,942	(3) 8,054	(3) 403	(3) 273	9,315	3,944
Egypt. . . . .	73	35	0	0	766	935	0	2	10,835	1,371
Un. of S. Africa. (a)	—	—	—	—	(2) 82,480	(2) 120,192	(2) 0	(2) 33	3,752	2
(b)	—	—	—	—	(2) 1,479	(2) 1,204	(2) 545	(2) 430	280,750	33
Australia. . . . . (a)	58,923	47,536	589	205	434,654	412,345	650	470	4,830	500
(b)	3,014	1,872	7	0	26,914	16,956	7	37	749,742	2,387
New Zealand. . . . . (a)	35,093	25,217	0	0	48,268	45,261	2	0	43,923	53
(b)	3,979	3,382	0	0	15,014	11,188	2	0	72,382	0
<i>Importing Countries:</i>										
Germany. . . . . (a)	1,585	260	25,322	26,656	8,239	3,230	63,924	100,264	11,305	329,621
(b)	847	646	2,282	1,995	5,397	4,669	12,218	11,629	13,163	30,552
Austria. . . . .	11	22	313	1,385	40	154	3,371	5,725	254	14,264
Belgium. . . . . (a)	—	—	—	—	(2) 4,484	(2) 4,405	(2) 20,416	(2) 31,890	10,311	188,435
(b)	—	—	—	—	(2) 8,278	(2) 7,282	(2) 1,188	(2) 1,398	21,638	8,918
Denmark. . . . .	33	2	209	265	90	15	1,927	1,532	93	3,561
Finland. . . . .	4	0	234	212	75	20	972	1,010	84	2,323
France. . . . .	3,318	4,003	47,060	47,590	23,455	21,427	124,795	157,417	51,506	480,966
Gr. Britain and N. Ir.	32,091	28,466	103,106	103,247	101,821	108,106	307,786	273,463	309,823	821,498
Greece. . . . .	0	9	271	187	57	157	1,127	1,164	392	8,025
Italy. . . . . (a)	130	119	18,602	10,199	730	780	42,135	36,901	2,161	96,688
(b)	174	42	1,173	776	963	875	7,123	4,341	4,967	9,599
Norway. . . . .	88	13	198	216	381	304	977	756	725	1,593
Netherlands. . . . . (a)	192	209	730	1,878	1,003	807	2,460	3,843	2,394	8,770
(b)	143	40	705	644	306	137	3,133	2,624	388	7,184
Poland. . . . .	139	410	3,117	4,001	1,069	985	9,597	12,125	2,610	38,253
Sweden. . . . .	—	—	2,423	1,609	—	—	7,540	5,675	—	15,461
Switzerland. . . . .	13	18	2,147	2,646	298	24	7,238	8,259	366	13,922
Czechoslovakia. . . . .	227	86	3,578	2,366	1,380	580	15,516	11,938	1,590	36,962
Yugoslavia. . . . .	0	0	494	1,327	71	22	1,316	3,298	24	7,968
Canada. . . . .	386	29	633	1,131	3,684	829	2,194	3,327	2,271	12,017
United States. . . . .	172	79	12,555	13,768	538	617	55,208	51,251	2,224	158,041
Japan. . . . .	0	0	22,769	16,215	31	2	64,232	46,502	13	142,253
Tunis. . . . .	0	0	11	24	42	64	223	408	461	800
<b>Totals. . . . .</b>	<b>111,405</b>	<b>152,971</b>	<b>249,706</b>	<b>239,534</b>	<b>893,756</b>	<b>696,359</b>	<b>767,935</b>	<b>763,651</b>	<b>2,134,748</b>	<b>2,405,599</b>

(a) = Wool, greasy; (b) = Wool, scoured.

(2) (3) See notes page 214.



COUNTRIES	JANUARY		SEVEN MONTHS (July 1-Jan. 31)		TWELVE MONTHS (July 1-June 30)	COUNTRIES	JANUARY		SEVEN MONTHS (July 1-Jan. 31)		TWELVE MONTHS (July 1-June 30)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Coffee. (Thousand lbs.)</b>						<b>Tea. (Thousand lbs.)</b>					
<b>EXPORTS.</b>						<b>EXPORTS.</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Brazil . . . . .	...	...	21,003,276	21,117,721	2,317,200	Ceylon . . . . .	19,227	20,344	127,053	131,085	247,897
India . . . . .	230	1,505	3,135	6,806	23,490	India . . . . .	20,785	26,105	288,798	293,136	347,401
Java and Madura . . . . .	...	...	(2) 27,520	(2) 26,041	38,105	Java and Madura . . . . .	...	...	(2) 79,188	(2) 72,217	158,936
						Japan . . . . .	739	763	16,907	15,895	24,315
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	77	328	1,200	776	1,345	Belgium . . . . .	0	2	15	20	31
Belgium . . . . .	881	798	6,896	1,609	5,090	Irish Free State . . . . .	22	9	148	95	185
France . . . . .	4	2	11	55	60	France . . . . .	4	2	49	22	35
Netherlands . . . . .	2,218	1,980	8,150	11,625	10,059	Gr. Brit. and N. Ir. . . . .	6,369	7,066	53,720	51,412	87,052
Portugal . . . . .	99	22	804	340	553	Netherlands . . . . .	11	7	77	64	115
Switzerland . . . . .	84	40	417	187	399	United States . . . . .	95	37	309	313	476
Canada . . . . .	2	2	26	37	55	Syria and Lebanon . . . . .	...	...	(2) 4	(2) 11	18
United States . . . . .	1,532	1,149	9,488	13,933	24,203	Algeria . . . . .	...	...	(2) 26	(2) 11	22
Ceylon . . . . .	0	0	0	223	227	Union of S. Africa . . . . .	...	...	(2) 22	(2) 35	66
Syria and Lebanon . . . . .	...	...	(2) 4	(2) 37	62	Australia . . . . .	24	53	368	582	851
Australia . . . . .	2	4	35	29	53	New Zealand . . . . .	...	...	(2) 37	(2) 64	115
<b>Totals . . . . .</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,430,051</b>	<b>Totals . . . . .</b>	<b>56,276</b>	<b>54,448</b>	<b>566,781</b>	<b>564,962</b>	<b>867,015</b>
<b>IMPORTS.</b>						<b>IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	28,091	12,507	188,134	206,907	350,362	Germany . . . . .	1,105	1,874	6,374	8,210	12,741
Austria . . . . .	988	1,801	9,165	12,139	23,268	Austria . . . . .	99	123	723	811	1,409
Belgium . . . . .	15,408	11,870	79,539	64,538	123,457	Belgium . . . . .	49	49	342	355	639
Bulgaria . . . . .	108	106	802	897	1,680	Denmark . . . . .	150	132	783	701	1,296
Denmark . . . . .	6,464	5,767	38,327	34,615	63,224	Spain . . . . .	20	9	165	181	282
Spain . . . . .	3,680	2,734	27,344	40,308	68,795	Estonia . . . . .	33	13	101	90	146
Estonia . . . . .	33	11	150	194	309	Irish Free State . . . . .	1,060	1,863	15,307	14,047	24,346
Irish Free State . . . . .	20	51	231	231	525	Finland . . . . .	13	15	174	148	260
Finland . . . . .	1,731	450	20,739	28,947	40,442	France . . . . .	322	309	1,953	1,942	3,536
France . . . . .	26,916	31,200	243,400	227,573	406,168	Gr. Britain and N. Ireland . . . . .	56,619	54,095	383,028	380,472	541,616
Gr. Britain and N. Ireland . . . . .	3,305	3,322	21,401	21,394	37,858	Greece . . . . .	53	40	430	456	644
Greece . . . . .	728	1,014	8,625	7,414	12,959	Hungary . . . . .	35	55	432	493	650
Hungary . . . . .	410	483	3,702	4,138	7,598	Italy . . . . .	24	20	194	183	326
Italy . . . . .	8,371	9,030	54,719	57,184	98,430	Latvia . . . . .	...	...	(2) 79	(2) 90	168
Latvia . . . . .	...	...	(2) 212	(2) 196	361	Lithuania . . . . .	...	...	(2) 71	(2) 90	179
Lithuania . . . . .	...	...	(2) 203	(2) 265	478	Norway . . . . .	37	26	240	220	388
Norway . . . . .	2,332	2,926	22,642	20,728	37,690	Netherlands . . . . .	2,659	2,855	17,639	17,646	32,512
Netherlands . . . . .	9,875	9,147	64,646	61,022	100,483	Poland . . . . .	783	397	2,972	2,723	4,614
Poland . . . . .	3,783	1,312	13,073	10,205	17,589	Portugal . . . . .	31	31	366	351	597
Portugal . . . . .	608	571	6,583	6,193	11,418	Sweden . . . . .	84	84	551	516	928
Sweden . . . . .	12,326	7,826	79,226	57,422	100,829	Switzerland . . . . .	99	112	1,010	948	1,781
Switzerland . . . . .	2,668	1,828	18,958	15,535	31,608	Czechoslovakia . . . . .	77	148	1,278	1,014	1,473
Czechoslovakia . . . . .	1,766	2,721	18,995	15,675	29,026	Yugoslavia . . . . .	22	31	463	478	623
Yugoslavia . . . . .	1,288	1,702	10,441	12,048	20,862	Canada . . . . .	3,803	2,191	17,544	27,094	48,147
Canada . . . . .	2,304	2,560	16,477	17,384	33,689	United States . . . . .	10,029	7,289	58,985	56,091	87,151
United States . . . . .	101,006	144,452	929,849	900,355	1,728,578	Chile . . . . .	...	...	(2) 2,820	(2) 2,598	5,992
Chile . . . . .	...	...	(2) 5,313	(2) 4,758	10,516	Syria and Lebanon . . . . .	...	...	(2) 337	(2) 214	551
Ceylon . . . . .	66	725	2,709	2,284	3,148	Turkey . . . . .	...	...	(2) 948	(2) 1,118	2,188
Japan . . . . .	410	445	2,967	2,500	4,478	Algeria . . . . .	...	...	(2) 1,340	(2) 1,545	3,180
Syria and Lebanon . . . . .	...	...	(2) 1,246	(2) 1,440	2,732	Egypt . . . . .	750	928	8,417	6,773	18,616
Turkey . . . . .	...	...	(2) 5,238	(2) 6,268	12,853	Tunis . . . . .	260	412	5,540	1,989	2,952
Algeria . . . . .	...	...	(2) 14,511	(2) 14,890	30,827	Union of S. Africa . . . . .	...	...	(2) 7,897	(2) 6,557	18,298
Egypt . . . . .	1,230	1,087	8,909	7,002	14,857	Australia . . . . .	2,754	4,081	25,907	30,642	46,441
Tunis . . . . .	196	306	1,903	1,967	3,036	New Zealand . . . . .	...	...	(2) 5,415	(2) 5,496	14,405
Un. of S. Africa . . . . .	...	...	(2) 15,701	(2) 15,840	31,890	<i>Exporting Countries:</i>					
Australia . . . . .	201	190	1,792	1,493	2,619	India . . . . .	348	584	5,024	4,012	6,232
New Zealand . . . . .	...	...	(2) 236	(2) 214	480	Java and Madura . . . . .	...	...	(2) 6,550	(2) 7,381	11,830
<i>Exporting Countries:</i>						<b>Totals . . . . .</b>	<b>81,418</b>	<b>78,366</b>	<b>581,412</b>	<b>591,035</b>	<b>881,182</b>
India . . . . .	0	569	60	2,806	4,090						
Java and Madura . . . . .	...	...	...	...	...						
<b>Totals . . . . .</b>	<b>297,131</b>	<b>288,702</b>	<b>1,398,357</b>	<b>1,391,118</b>	<b>3,469,097</b>						

(2) See notes page 214.

COUNTRIES	JANUARY		FOUR MONTHS (Oct. 1-Jan. 31)		TWELVE MONTHS (Oct. 1-Sept. 30)	COUNTRIES	JANUARY		SIX MONTHS (August 1-Jan. 31)		TWELVE MONTHS August 1- (July 31)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Cacao (Thousand lbs.).</b>						<b>Total Wheat and Flour (*)</b> (Thousand centals).					
<b>EXPORTS.</b>						<b>a) NET EXPORTS</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada . . . . .	882	972	2,163	2,465	9,905	Bulgaria . . . . .	474	11	3,843	933	3,527
Dominican Republ. . . . .	3,120	2,207	6,587	9,918	61,348	Spain . . . . .	0	15	(5)	40	104
Brazil . . . . .	...	...	(2) 67,888	(2) 47,102	146,480	Hungary . . . . .	403	509	8,453	7,516	10,591
Ecuador . . . . .	3,042	2,458	6,292	8,713	33,076	Lithuania . . . . .	...	...	(2) 20	(2) 212	567
Trinidad . . . . .	3,186	5,020	16,341	14,917	61,569	Poland . . . . .	31	134	421	1,521	2,586
Venezuela . . . . .	2,646	3,278	5,864	9,065	45,076	Rumania . . . . .	...	...	(2) 19,619	(2) 6,001	9,557
Ceylon . . . . .	132	1,116	2,981	3,699	8,360	U. S. S. R. . . . .	...	...	17,22,019	17,14,617	(7) 67,785
Java and Madura . . . . .	...	...	(2) 858	(2) 888	3,073	Yugoslavia . . . . .	373	42	6,733	2,851	3,392
Cameroon . . . . .	3,968	3,139	15,155	14,575	30,126	Canada . . . . .	6,543	6,777	70,162	93,232	154,489
Ivory Coast . . . . .	...	...	(2) 7,848	(2) 7,524	45,248	United States . . . . .	3,942	2,352	38,358	38,244	65,495
Gold Coast . . . . .	90,615	93,452	320,670	241,037	486,374	Argentina . . . . .	5,068	6,559	26,085	17,904	78,583
Nigeria . . . . .	21,828	20,873	54,485	59,825	116,385	Chile . . . . .	...	...	(2) 11	(2) 509	567
St. Thomas and Prince Is. . . . .	1,482	2,654	11,069	11,632	26,764	British India . . . . .	90	(5)	595	664	(5)
Togoland . . . . .	2,205	2,617	5,291	5,785	16,400	Syria and Lebanon . . . . .	...	...	(2) 306	(5)	(5)
						Turkey . . . . .	...	...	(2) 258	(2) 163	282
						Algeria . . . . .	...	...	(2) 688	(2) 4,760	4,614
						Tunis . . . . .	(5)	2	1,382	1,341	3,481
						Australia . . . . .	11,726	10,686	36,628	30,100	90,379
<b>Totals . . .</b>	<b>134,426</b>	<b>148,941</b>	<b>531,363</b>	<b>444,815</b>	<b>1,110,963</b>	<b>Totals . . .</b>	<b>28,650</b>	<b>27,087</b>	<b>236,481</b>	<b>221,123</b>	<b>490,889</b>
<b>IMPORTS.</b>						<b>b) NET IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	121	0	359	432	454	Germany . . . . .	968	1,102	1,975	9,383	18,680
Belgium . . . . .	104	84	333	168	809	Austria . . . . .	847	672	4,491	3,607	9,345
France . . . . .	0	0	2	75	223	Belgium . . . . .	1,526	1,091	13,986	14,317	29,125
Netherlands . . . . .	143	1,008	3,565	4,337	10,679	Denmark . . . . .	573	750	6,850	3,777	6,905
Czechoslovakia . . . . .	0	0	0	15	18	Spain . . . . .	(6)	(6)	18	(5)	(6)
United States . . . . .	935	445	2,903	2,610	8,521	Estonia . . . . .	13	29	159	348	485
Australia . . . . .	11	18	119	37	86	Irish Free State . . . . .	806	844	5,869	6,080	11,279
						Finland . . . . .	90	106	1,574	1,850	2,956
						France . . . . .	1,462	2,101	18,237	12,968	38,595
						Gr. Brit. and N. Ir. . . . .	6,144	8,704	78,782	73,401	134,811
						Greece . . . . .	985	1,001	6,042	6,038	14,454
						Italy . . . . .	882	3,377	3,003	23,451	48,822
						Latvia . . . . .	...	...	(2) 245	(2) 498	924
						Norway . . . . .	357	181	2,864	2,826	4,986
						Netherlands . . . . .	1,618	2,573	8,900	12,189	20,858
						Portugal . . . . .	4	37	588	240	1,607
						Sweden . . . . .	381	176	1,984	1,944	2,939
						Switzerland . . . . .	(7) 981	(7) 1,043	(7) 7,509	(7) 6,367	(7) 11,094
						Czechoslovakia . . . . .	873	70	8,157	7,679	10,302
						Ceylon . . . . .	71	51	328	340	597
						India . . . . .	(6)	410	(6)	(6)	3,062
						Indochina . . . . .	37	62	271	326	671
						Japan . . . . .	1,038	1,349	4,273	3,424	10,964
						Java and Madura . . . . .	...	...	(2) 712	(2) 511	1,867
						Syria and Lebanon . . . . .	...	...	(6)	(2) 42	101
						Egypt . . . . .	335	922	2,211	3,247	5,768
						Tunis . . . . .	18	(6)	(6)	(6)	(6)
						Union of South Afr. . . . .	...	...	(2) 529	(2) 842	1,636
						New Zealand . . . . .	...	...	(2) 174	(2) 185	487
<b>Totals . . .</b>	<b>119,396</b>	<b>111,097</b>	<b>351,651</b>	<b>343,271</b>	<b>1,156,043</b>	<b>Totals . . .</b>	<b>19,869</b>	<b>26,720</b>	<b>180,629</b>	<b>196,170</b>	<b>390,975</b>

(\*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

a) Excess of exports over imports. — b) Excess of imports over exports.

(1) Data up to 30th September. — (2) Data up to 31st December. — (3) Data up to 30th November. — (4) Data up to 30th June.

— (5) See Net Imports. — (6) See Net Exports. — (7) Wheat only.

## STOCKS

STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS  
IN GERMANY, ON FEBRUARY 15.

PRODUCTS	% Stocks: total production				% Available saleable quantities: total production			
	Feb. 15, 1932	Jan. 15, 1932	Feb. 15, 1931	Feb. 15, 1930	Feb. 15, 1932	Jan. 15, 1932	Feb. 15, 1931	Feb. 15, 1930
Winter wheat . . . . .	22.6	31.4	23.4	32.2	16.9	24.4	16.8	25.1
Spring wheat . . . . .	48.5	58.4	50.5	52.9	38.6	47.8	37.3	41.1
Winter rye . . . . .	25.1	33.7	35.2	41.1	9.9	13.8	17.0	22.1
Winter barley . . . . .	15.3	20.4	16.7	26.6	2.2	3.2	2.0	5.6
Spring barley . . . . .	31.6	44.7	26.3	39.1	15.3	25.6	10.5	21.4
Oats . . . . .	50.9	60.0	54.1	57.2	11.9	13.9	13.3	20.4
Potatoes . . . . .	40.8	47.6	40.9	43.4	12.5	14.4	11.9	12.3

Authority: Preisberichtstelle beim Deutschen Landwirtschaftsrat.

WHEAT AND WHEAT-FLOUR STOCKS HELD BY COMMERCIAL MILLS IN THE UNITED STATES (1).

Specification and situation	Last day of month					Last day of month				
	Dec. 1931	Sept. 1931	June 1931	Dec. 1930	Dec. 1929	Dec. 1931	Sept. 1931	June 1931	Dec. 1930	Dec. 1929
	1,000 centals					1,000 bushels or barrels				
Wheat held by mills and mill elevators attached to mills. . . . .	54,571	57,951	12,601	53,687	60,057	90,952	96,586	21,001	80,478	100,095
Wheat in transit to merchant mills and bought to arrive . . . . .	1,085	8,995	7,048	7,274	5,987	1,808	14,991	11,746	12,123	9,978
Wheat-flour in mills and warehouses, and in transit, sold and unsold . . . . .	8,087	6,922	5,546	7,872	9,259	4,126	3,532	2,830	4,016	4,724
TOTAL (2) . . . . .	67,291	76,906	27,628	72,286	79,366	112,152	128,176	46,017	120,477	132,276

(1) Partial census, including mills accounting for over 90 % of the total capacity of all commercial mills; see article about cereal stocks on page 502 of Crop Report for August. — (2) Including flour in terms of wheat.

STOCKS IN FARMERS' HANDS IN THE UNITED STATES, ON MARCH 1ST.

PRODUCTS	% stocks: total production			Estimated stocks in absolute figures					
	March 1, 1932	March 1, 1931	March 1, 1930	March 1, 1932	March 1, 1931	March 1, 1930	March 1, 1932	March 1, 1931	March 1, 1930
				1,000 centals			1,000 bushels		
Wheat . . . . .	23.2	18.8	15.9	124,394	96,865	77,641	207,328	161,442	128,402
Rye . . . . .	17.6	20.8	13.2	3,220	5,169	2,577	5,750	9,231	4,602
Barley . . . . .	20.8	26.3	24.0	19,899	38,478	32,294	41,457	80,162	67,280
Oats . . . . .	33.5	33.6	32.9	119,084	137,477	117,874	372,136	429,616	368,856
Maize . . . . .	43.2	34.1	37.8	618,067	398,976	536,542	1,108,691	708,529	958,111

## COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930
	1,000 centals					1,000 bushels				
<b>WHEAT:</b>										
Canadian in Canada. . . . .	103,195	104,150	103,579	103,619	107,213	171,091	173,508	172,631	172,609	178,080
U. S. in Canada. . . . .	16,609	17,191	17,152	2,791	3,968	27,682	28,052	28,586	4,951	6,613
U. S. in the United States. . . .	129,770	130,631	130,066	125,214	99,404	216,284	217,719	226,776	208,600	160,074
Canad. in the United States. . . .	8,741	13,143	15,127	10,851	18,910	14,560	21,995	25,212	18,085	31,516
Total . . . . .	258,315	265,121	271,924	242,655	226,495	430,526	441,889	453,205	404,125	377,492
<b>RYE:</b>										
Canadian in Canada. . . . .	0,145	0,250	6,425	7,313	4,770	10,073	11,161	11,473	13,059	8,517
U. S. in Canada. . . . .	378	478	422	1,191	1,410	675	853	754	2,126	2,510
U. S. in the United States. . . .	5,603	5,648	5,725	7,991	8,052	10,005	10,085	10,223	14,270	14,379
Canad. in the United States. . . .	778	954	978	295	208	1,389	1,703	1,746	528	371
Total . . . . .	12,904	13,330	13,550	16,799	14,440	23,042	23,802	24,196	29,983	25,786
<b>BARLEY:</b>										
Canadian in Canada. . . . .	4,741	4,741	4,786	13,565	11,849	9,878	9,878	9,070	28,259	* 24,685
U. S. in Canada. . . . .	12	12	12	139	451	25	25	25	291	939
U. S. in the United States. . . .	2,438	2,741	2,057	5,894	4,999	5,184	5,710	6,160	12,279	10,415
Canad. in the United States. . . .	745	762	762	608	1,405	1,552	1,587	1,587	1,267	2,928
Total . . . . .	7,986	8,256	8,517	20,206	18,704	16,639	17,200	17,742	42,006	38,967
<b>OATS: (1)</b>										
Canadian in Canada. . . . .	4,966	4,972	5,208	4,602	6,286	15,519	15,538	16,556	14,061	19,645
U. S. in Canada. . . . .	1	4	56	284	970	2	12	175	887	3,030
U. S. in the United States. . . .	5,739	5,471	5,370	7,369	7,340	17,935	17,096	16,782	23,029	22,937
Canad. in the United States. . . .	1	1	10	1	197	2	2	32	3	615
Total . . . . .	10,707	10,448	10,734	12,246	14,793	33,458	32,648	33,545	38,980	46,227
<b>MAIZE:</b>										
U. S. in Canada. . . . .	488	410	515	236	85	871	732	920	423	152
of other origin in Canada. . . .	1,000	1,122	1,177	402	738	1,786	2,003	2,102	717	1,317
U. S. in the United States. . . .	10,356	7,939	7,085	11,200	13,969	18,492	14,176	12,051	20,107	24,044
Total . . . . .	11,844	9,471	8,777	11,898	14,792	21,149	16,911	15,073	24,247	26,113

(1) All oats expressed in bushels of 32 lbs.

## QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

PRODUCTS	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat). . . . .	34,790	30,413	17,890	34,728	22,003	57,984	50,688	29,816	57,880	36,672
Rye . . . . .	1,253	1,219	1,445	542	192	2,237	2,177	2,580	969	343
Barley . . . . .	2,756	3,084	1,800	4,292	3,160	5,742	6,425	3,750	8,942	6,588
Oats . . . . .	2,995	2,435	838	2,330	874	9,380	7,610	2,620	7,280	2,730
Maize . . . . .	12,134	14,501	22,262	14,717	10,248	21,669	25,894	39,754	26,280	18,900

Authority: Broomhall's Corn Trade News.

## GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930
	1,000 centals					1,000 bushels				
<b>WHEAT :</b>										
Grain . . . . .	9,336	9,792	13,320	6,012	7,306	15,509	16,320	22,200	11,520	12,176
Flour as grain . .	960	804	1,008	864	854	1,600	1,440	1,680	1,440	1,424
TOTAL . . . . .	10,296	10,596	14,328	7,776	8,160	17,109	17,760	23,880	12,960	13,600
Barley . . . . .	880	800	1,120	1,300	1,200	1,833	1,667	2,333	2,833	2,500
Oats . . . . .	320	448	448	1,104	640	1,000	1,400	1,400	3,450	2,000
Maize . . . . .	5,904	6,048	5,976	2,448	2,472	10,543	10,800	10,671	4,371	4,414

Authority: *Broomhall's Corn Trade News*.  
(1) Imported cereals.

## STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930
	1,000 centals					1,000 bales (1 bale = 478 lbs.)				
<b>Great Britain :</b>										
American . . . . .	1,080	2,111	2,032	2,780	2,450	416	442	425	581	515
Argentine, Brazil- ian, etc. . . . .	83	98	206	204	679	17	21	43	43	142
Peruvian, etc. . .	194	220	262	344	345	41	47	55	72	72
East Indian, etc.	552	575	635	488	215	115	120	133	102	45
Egyptian, Sudan- ese . . . . .	1,470	1,392	1,300	1,486	1,016	308	291	274	311	213
Other (1) . . . . .	126	140	179	234	251	26	36	37	49	52
TOTAL . . . . .	4,414	4,543	4,623	5,536	4,965	923	950	967	1,158	1,039
<b>Bremen :</b>										
American . . . . .	1,486	1,601	1,729	2,458	2,426	311	335	361	514	508
Other . . . . .	22	23	18	58	35	5	5	4	12	7
TOTAL . . . . .	1,508	1,624	1,747	2,516	2,461	316	340	365	526	515
<b>Le Havre :</b>										
American . . . . .	805	752	863	1,501	1,329	168	157	181	333	278
Other . . . . .	55	109	117	164	108	12	23	24	34	23
TOTAL . . . . .	860	861	980	1,755	1,437	180	180	205	367	301
<b>Total Continent (2) :</b>										
American . . . . .	3,141	3,266	3,621	4,665	4,382	657	683	682	976	917
Argentine, Brazil- ian, etc. . . . .	32	30	45	121	53	7	8	9	25	11
E. Indian, Austra- lian, etc. . . . .	90	108	95	195	97	19	23	20	41	20
Egyptian . . . . .	124	157	142	104	95	26	33	30	22	20
W. Indian, W. Afri- can, E. African, etc. . . . .	28	28	32	76	81	6	6	7	16	17
TOTAL . . . . .	3,415	3,598	3,575	5,161	4,708	715	753	748	1,080	985

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

## STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930	Feb. 1932	Jan. 1932	Dec. 1931	Feb. 1931	Feb. 1930
	1,000 centals					1,000 bales (counting round as half bales)				
In consuming establishments . . . .	7,818	7,833	7,799	7,407	8,822	1,634	1,637	1,630	1,548	1,812
In public storage and at compresses . .	45,510	48,008	48,888	35,045	23,880	9,511	10,032	10,426	7,324	4,850
TOTAL . . .	53,328	55,841	56,687	42,452	32,702	11,145	11,669	12,056	8,872	6,661

## STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930
	1,000 centals					1,000 bales (1 bale = 476 lbs.)				
Bombay (1) . . . .	2,180	1,760	1,516	3,815	5,202	456	388	317	798	1,088
Alexandria . . . .	5,065	5,468	5,587	5,153	3,642	1,080	1,144	1,149	1,078	762

Authorities: *East Indian Cotton Ass.* and *Bourse de Minet-el-Bassal*.

(1) Stocks held by exporters, dealers and mills.

## STOCKS OF CEREALS IN COMMERCIAL ELEVATORS AND MILLS IN GERMANY, ON FEBRUARY 29, 1932 (1).

PRODUCTS	Home grown cereals	Imported cereals		Total	Home grown cereals	Imported cereals		Total
		duty paid	duty not paid			duty paid	duty not paid	
	1,000 centals				1,000 bushels or barrels			
WHEAT :								
Grain . . . . .	9,634	1,587	705	11,926	16,057	2,846	1,176	19,879
Flour for bread . . . . .	3,086	176	4	3,266	1,575	90	2	1,667
TOTAL (2) . . .	12,750	1,823	712	16,285	22,917	3,039	1,187	27,143
RYE :								
Grain . . . . .	4,387	551	2,954	7,892	7,834	984	5,275	14,093
Flour for bread . . . . .	1,301	35	2	1,338	664	18	1	683
TOTAL (2) . . .	6,122	597	2,956	9,675	10,933	1,067	5,279	17,279
BARLEY . . . . .	2,822	485	639	3,946	5,879	1,010	1,332	8,221
OATS . . . . .	2,844	11	15	2,870	8,887	34	43	8,969

(1) The "Statistische Reichsamt" has begun the monthly publication of statistics of stocks of cereals in commercial elevators and mills. The data relate to 90 % of the concerns. The quantities in malt-houses, factories for food specialities and coffee substitutes, as well as bakers stocks are not included. — (2) Including flour in terms of grain.

## MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTIONS	March	March	March	Feb.	Average (2)				
	18,	11,	4,	26,	Feb. 1932	March 1931	March 1930	Commercial Season	
	1932	1932	1932	1932					
	1930-31	1929-30							
WHEAT.									
Budapest (b): Tisza region (78-80 kg. p. hl.; pengő p. quintal) . . . . .	13.87	14.42	13.82	13.75	13.21	16.07	n. 23.00	15.34	22.94
Braila: Good quality (lei p. quintal) (3) . . . . .	...	315	315	315	4)292	316	565	351	612
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.) . . . . .	61 ½	66 ⅞	65 ½	66 ¼	63 ¾	56 ⅞	106 ⅞	64 ¼	124 ⅞
Chicago: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	54	58 ⅞	58 ½	59 ⅞	59	79 ¾	108 ¼	78	114 ⅞
Minneapolis: No. 1 Northern (cents p. 60 lbs.) . . . . .	67 ⅞	72 ¾	72 ½	73 ⅞	73 ¾	76 ¼	106 ⅞	77 ⅞	117 ½
New York: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	66	70 ½	70 ¾	71 ⅞	71 ⅞	n. q.	110 ⅞	n. 91 ⅞	121 ⅞
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper p. quintal) . . . . .	6.95	7.15	7.05	7.05	6.64	5.61	10.44	6.33	10.65
Karachi: Karachi white, 2 ½ barley, 1 ½ % dirt (rupees p. 656 lbs.) . . . . .	22-8-0	23-2-0	23-6-0	23-11-0	24-8-9	19-7-6	33-14-0	19-15-2	36-6-0
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	24.80	24.80	24.50	24.90	24.60	28.86	24.12	26.00	25.33
Hamburg, c. i. f. (Reichsmarks p. quintal):									
No. 3 Manitoba . . . . .	(5) 11.22	(5) 11.69	(5) 11.30	(5) 11.56	(5) 10.97	(5) 12.03	18.65	—	21.30
No. 2 Hardwinter . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	18.14	n. 13.00	19.49
Barusso (79 kg. p. hectol.) . . . . .	(6) 9.18	(6) 9.45	(6) 9.35	(6) 9.43	(6) 8.86	9.71	16.69	11.10	18.72
Antwerp (Belgian francs p. quintal):									
Home grown . . . . .	n. q.	n. q.	75	75	74 ½	89	136	95 ½	154 ⅞
No. 2 Hard Winter, Gulf . . . . .	(7) 94	(7) 92	(7) 94	(7) 91	(7) 85 ¾	124 ½	158	112 ¾	171
Paris: Home grown, 75-77 kg. (francs p. quintal) . . . . .	172.25	174.25	172.00	171.50	171.60	181.25	133.20	175.00	139.40
London: Home grown (shillings p. 504 lbs.) . . . . .	26/-	26/-	26/-	25/6	25/0	22/6	37/1	27/1	40/10
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):									
South Russian (on sample) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	20/4	n. q.	23/7	n. q.
No. 3 Manitoba . . . . .	28/10 ½	30/-	30/9	31/1 ½	29/6	23/3	39/4	25/4	45/2
No. 2 Hard Winter . . . . .	27/6	8)29/1 ½	8)30/1 ½	8)30/7 ¾	(8) 28/6	(7) 24/8	38/7	26/4	41/5
White Pacific . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	39/-	26/7	42/3
Rosafé (63 ½ lbs.), adcoat . . . . .	(9) 25/6	(9) 25/9	(9) 26/3	(9) 27/3	(9) 26/-	(10) 20/1	37/1	23/5	40/3
Choice White Karachi . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	40/-	27/-	42/2
Australian . . . . .	27/9	28/3	29/-	29/3	27/11	21/4	39/4	25/7	43/6
Milan (b): Home grown, soft (liras p. quintal) . . . . .	n. q.	119.00	119.00	119.00	115.75	104.25	130.75	109.10	131.30
Genoa c. i. f. (shillings p. metric ton): La Plata . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. 94/10	164/-	110/-	184/6
RYE.									
Budapest (b): Home grown (pengő p. quintal) . . . . .	15.50	15.55	14.50	14.37	13.64	11.20	n. 11.60	10.79	13.44
Berlin: Home grown (Reichsmarks per quintal) . . . . .	19.50	19.40	19.40	19.40	19.75	17.92	14.65	17.13	17.04
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. quintal) . . . . .	9.43	9.74	9.09	8.84	8.39	n. q.	11)13.33	n. 7.65	14.57
Minneapolis: No. 2 (cents p. 56 lbs.) . . . . .	46	49	48 ½	47	46 ⅞	36 ⅞	65 ⅞	42 ⅞	30 ⅞
Groningen (c): Home grown (florins p. quintal) . . . . .	5.25	n. q.	4.85	4.75	4.77	3.91	5.10	4.45	6.33
BARLEY.									
Braila: Average quality (lei p. quintal) (3) . . . . .	...	330	310	305	4)279	236	242	232	304
Winnipeg: No. 4 Western (cents p. 48 lbs.) . . . . .	36 ⅞	39 ⅞	38	38 ½	38 ¼	22 ⅞	41 ⅞	26 ⅞	51 ⅞
Chicago: Feeding (cents p. 48 lbs.) . . . . .	50	50	53	50	49 ¼	44	56 ⅞	48 ⅞	57 ⅞
Berlin: Home grown fodder (Reichsmarks per quintal) . . . . .	17.30	18.15	17.40	16.60	15.86	21.21	14.70	19.52	17.40
Antwerp: Danube (francs p. quintal) . . . . .	85	81	82	78 ¾	77	72	84	78 ¾	107 ½
London: English malting (shillings p. 448 pounds) . . . . .	37/6	37/6	37/6	37/6	37/6	40/-	37/-	35/3	39/-
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):									
Danubian 3 % . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	15/4	18/8	15/2	22/3
Russian (Azoff-Black sea) . . . . .	n. q.	n. q.	n. q.	n. q.	23/4	n. q.	18/1	14/3	18/11
Canadian Western, No. 3 . . . . .	23/4 ½	24/3	23/9	24/6	23/2	15/4	23/9	15/11	27/-
Californian malting (shillings p. 448 lbs.) . . . . .	n. q.	n. q.	37/6	38/-	38/6	23/7	30/8	27/3	32/6
Groningen (c): Home grown winter (fl. p. quintal) . . . . .	5.90	6.00	5.85	5.90	5.61	4.70	5.37	4.97	7.55

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) The specific gravity changes too frequently for indication. — (4) For previous prices see table on page 222. — (5) No. 2 Manitoba. — (6) 80-81 kg. p. hl. — (7) No. 1 Hard Winter. — (8) Without indication of quality. — (9) 54 lbs. p. bushel. — (10) 53 lbs. p. bushel. — (11) 73 kg. p. hl.

PRODUCTS, MARKETS AND DESCRIPTION	Average (1)							
	March 18, 1932	March 11, 1932	March 4, 1932	Feb. 26, 1932	Feb. 1932	March 1932	March 1930	Commercial Season
								1930-31 1929-30
<b>OATS.</b>								
Braila: Good quality (lei p. quintal) (2) . . . . .	...	320	295	307	3204	251	215	247 256
Winnipeg: No. 2 White (cents per 34 lbs.) . . . . .	20 1/2	30 7/8	30 3/4	20 7/8	20 1/2	27 3/4	55 1/8	30 58 1/2
Chicago: No. 2 White (cents per 32 lbs.) . . . . .	25 1/2	25	25 1/4	24	24 7/8	32	44	32 7/8 44 1/2
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	5.40	5.70	5.40	5.40	4.90	3.14	4.31	3.58 5.30
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	15.75	16.25	15.45	15.25	14.85	15.77	12.01	16.17 15.02
Paris: Home grown, black and other (francs p. quintal) . . . . .	112.15	111.50	107.25	107.25	105.80	79.90	60.05	81.00 81.15
London: Home grown white (shillings p. 336 lbs.) . . . . .	21/3	21/3	21/3	21/-	21/-	17/6	18/-	18/4 21/-
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.):								
Danubian (39-40 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. 12/1 4) 18/4
Plate (f. a. q.) . . . . .	15/4 1/2	15/6	15/4 1/2	15/6	14/8	9/10	12/8	10/9 16/1
Chilian Tawny . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	10/10	13/7	12/- 17/3
Milan (b): spot (liras p. quintal):								
Home grown . . . . .	n. q.	76.50	76.50	76.50	76.50	73.50	78.25	73.05 80.75
Foreign imported . . . . .	n. q.	63.50	64.00	64.00	65.00	55.00	66.25	60.40 74.30
<b>MAIZE.</b>								
Braila: Danube (lei p. quintal) . . . . .	...	230	205	200	3) 176	227	280	210 300
Chicago: No. 2 Mixed American (cents p. 56 lbs.) . . . . .	34	36	36	35 1/4	36 3/4	61 7/8	80	58 1/4 85 7/8
Buenos Aires (a): Yellow Plate (pesos paper p. quintal) . . . . .	5.05	5.20	5.00	4.95	4.40	4.04	6.10	3.82 6.17
Antwerp, spot (Belgian francs p. quintal):								
Bessarabian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	74	n. q.	n. 71 1/4 97 1/4
Cinquantino . . . . .	67	64	61	54	54	94	119 1/2	81 131 1/4
Yellow Plate . . . . .	64	61	59	53	52	74	100 1/2	65 109 1/4
London and Liverpool, parcels, c. i. f. (shillings p. 480 lbs.):								
Danube . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	5) 18/6	23/2	n. 17/4 24/11
Yellow Plate . . . . .	20/-	20/3	20/-	10/3	18/5	18/2	24/7	15/6 25/3
No. 2 White African . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	25/10	n. 26/-	n. 18/11 26/-
Milan (b): Home grown (liras p. quintal) . . . . .	n. q.	70.50	68.50	68.50	65.75	50.00	70.50	51.00 71.35
<b>RICE (CLEANED).</b>								
								1931 1930
Milan (b): Maratelli (lire p. quintal) . . . . .	n. q.	146.00	146.00	146.00	145.75	111.25	167.60	117.35 152.15
Rangoon: No. 2 Burma (rupees p. 7500 lbs.) . . . . .	325	330	335	295	210 5/8	246	398 3/4	249 3/4 393 3/4
Saigon (Indochinese piastres p. quintal):								
No. 1 Round white (25 % broken) . . . . .	6.21	6.34	6.39	6.15	(6) 6.18	7.02	11.78	6.73 11.36
No. 2 Japan (40 % broken) . . . . .	5.80	5.93	5.98	5.60	5.66	6.32	11.37	6.20 10.89
London (a): c. i. f. (shillings p. 112 lbs.):								
Spanish Belloch, No. 3 oiled . . . . .	13/1 1/2	13/4 1/2	13/9	13/4 1/2	14/-	12/1	15/-	11/11 14/1
Italian good, No. 6 oiled . . . . .	14/-	14/-	14/-	13/6	13/5	13/1	15/11	13/7 14/11
American Blue Rose . . . . .	17/6	17/6	18/-	18/6	19/1	18/4	23/-	18/7 21/9
Burma, No. 2 . . . . .	9/9	10/1 1/2	9/9 1/2	9/1	8/11	7/9	11/-	7/11 10/11
Saigon, No. 1 . . . . .	9/1 1/2	9/3	9/9	9/4 1/2	9/8	7/11	11/7	8/1 11/8
Slam, Garden, No. 1 . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	9/6	13/11	9/5 14/-
Tokio: Various qualities (yens p. koku) . . . . .	22.50	22.60	22.50	22.40	22.50	18.00	n. 27.35	18.46 25.57
<b>LINSEED.</b>								
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	9.45	9.75	9.60	9.75	9.42	10.82	19.06	10.82 17.19
Antwerp: Plate (Belgian francs p. quintal) . . . . .	108	108	113	112	106 3/4	175	395	146 284 1/4
Hull, c. i. f.: Plate (p. sterling p. 1. ton) . . . . .	8-10-0	8-12-6	8-17-6	9-0-0	8-16-10	9-6-3	18-0-0	8-14-1 15-0-5
London, c. i. f.: Bombay bold (p. st. p. long ton) . . . . .	12-0-0	12-10-0	12-10-0	13-5-0	12-18-9	12-12-6	18-18-9	11-9-6 17-14-4
Duluth: No. 1, Northern (cents p. 56 lbs.) . . . . .	7) 140 1/2	7) 141 1/4	7) 140 1/4	7) 141	7) 139	7) 157 1/8	7) 291 1/2	148 682

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) The specific gravity changes too frequently for indication. — (3) For previous prices see table on page 222. — (4) Weight not indicated. — (5) Dan., Galatz-Foxonian. — (6) Feb. 19: 6.26. — (7) May delivery.



PRODUCTS, MARKETS AND DESCRIPTION	March	March	March	Feb.	Average (1)					
	18,	11,	4,	26,	Feb.	March	March	Commercial		
	1932	1932	1932	1932	1932	1931	1930	Season		
COTTONSEED.								1930-31	1929-30	
Alexandria : Sakellaridis (piastres per ardeb) . . .	58.0	59.1	63.4	65.5	63.7	60.8	67.7	52.2	67.9	
Hull : Sakellaridis (p. sterl. per long ton) . . . .	6-0-0	6-2-6	6-11-3	6-13-0	6-11-10	6-15-7	7-1-7	5-12-6	6-18-2	
COTTON.										
New Orleans : Middling (cents per lb.) . . . . .	6.71	6.97	7.00	6.87	6.71	10.56	14.87	10.07	16.17	
New York : Middling (cents per lb.) . . . . .	6.85	7.05	7.15	7.05	6.86	10.89	15 17	10.38	16.60	
Bombay : M. g. Broach f. g. (rupees per 784 lbs.).	212	218	228	234	220	207	255	191 1/2	233 1/2	
Alexandria (a) (talaris per kantar) :										
Sakellaridis f. g. f. . . . .	13.07	12.62	13.92	14.32	13.92	17.68	26 7/8	17.12	28 1/2	
Ashmouni (Upper Egypt) f. g. f. . . . .	11.35	11.15	11.95	12.10	11.60	12.80	19 1/16	12.00	19 1/2	
Bremen : Middling (U. S. cents per lb.) . . . . .	8.22	8.27	8.31	8.34	8.06	12.18	16.69	11.59	18.27	
M. g. Broach fully good (pence per lb.) . . . .	n. 5.45	n. 5.25	n. 5.55	n. 5.55	n. 5.50	n. 5.11	n. 5.89	n. 4.63	n. 6.83	
Le Havre : Middling, Gulf (francs per 50 kg.) . .	248	248	246	238	232	373	500	349	545	
Liverpool (pence per lb.) :										
Middling fair . . . . .	n. 6.53	n. 6.53	n. 6.75	n. 6.84	n. 6.74	n. 7.16	n. 9.71	n. 6.93	n. 10.39	
Middling . . . . .	5.51	5.51	5.73	5.70	5.73	5.96	8.30	5.72	9.09	
São Paulo, good fair . . . . .	n. 5.73	n. 5.73	n. 5.95	n. 6.04	n. 5.94	6.24	8.39	5.91	9.02	
M. g. Broach, fully good . . . . .	n. 5.07	n. 5.11	n. 5.36	n. 5.52	n. 5.47	n. 4.56	n. 5.92	n. 4.25	n. 6.30	
Sakellaridis, fully good fair . . . . .	7.45	7.40	7.80	7.80	7.59	9.66	13.82	9.08	14.52	
BUTTER.								1931	1930	
Copenhagen (a) (Kr. p. quintal.) . . . . .	...	185	205	225	230	222	261	209	245	
Maastricht, auction (b) : Dutch (florins p. kg.) .	n. q.	n. q.	1.18	1.38	1.32	1.56	1.81	1.38	1.70	
Hamburg, auction (b) : Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . . . .	127.64	126.77	128.88	141.62	185.43	143.31	152.67	131.22	146.67	
Kempten (b) : Allgäu butter (Pfennige p. half kg.)	3) 120	3) 120	3) 120	3) 130	3) 121	124	135 1/2	110	128	
London (a) (shillings p. cwt.) :										
British blended . . . . .	135/4	135/4	135/4	130/8	130/8	144/8	172/8	140/4	158/8	
Danish . . . . .	132/-	138/-	142/-	154/-	139/6	145/6	166/-	133/4	153/6	
Irish creamery, salted . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	119/3	134/10	
Dutch . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	144/6	168/-	182/1	161/11	
Argentine . . . . .	114/-	115/-	114/-	113/-	110/8	127/-	148/-	117/7	135/10	
Siberian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	143/-	(4) 97/4	131/6	
Australian, salted . . . . .	112/-	111/-	111/-	114/-	108/6	125/-	142/6	116/8	135/9	
New Zealand, salted . . . . .	116/-	117/-	117/-	118/-	111/3	126/6	146/6	119/11	137/8	
CHEESE.										
Milan (lire per quintal) :										
Parmigiano-Reggiano, 1st quality of last year's production . . . . .	1,000	975	975	975	975	1,112	1,125	1,103	1,160	
Green Gorgonzola, mature, choice . . . . .	500	485	475	470	470	659	719	616	671	
Roma : Roman pecorino, choice (lire p. quintal) .	1,225	1,225	1,162	1,162	1,162	1,050	1,270	1,121	1,207	
Alkmaar : Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small; florins, p. 50 kg.) . . . . .	...	27.00	26.50	31.00	29.50	36.62	43.75	32.63	40.83	
Gouda : Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.) . . . . .	...	28.50	30.50	30.50	30.62	40.25	48.00	37.93	45.56	
Kempten (b) : (Pfennige per half kg.) :										
Softcheese, green (20 % butterfat) . . . . .	20 1/2	20 1/2	19 1/2	17 1/2	17 1/2	23	24 1/2	24	27	
Emmenthal from the Allgäu (whole milk cheese) 1st quality . . . . .	38	38	38	38	38	98 1/2	5) 101	97 1/2	(5) 97	
London (a) (shillings per cwt.) :										
English Cheddar . . . . .	122/-	120/-	120/-	118/-	115/-	104/-	116/-	99/10	103/4	
Canadian . . . . .	78/-	78/-	78/-	77/-	76/-	81/6	103/9	75/9	93/11	
New Zealand . . . . .	64/8	64/6	65/6	66/6	64/6	61/9	83/1	63/2	82/8	
Liverpool (a) : Engl. Cheshire, ungraded (sh. p. cwt.)	137/8	137/8	137/8	138/-	134/2	115/6	139/8	94/8	96/6	

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.  
 (1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) For previous prices  
 see table on page 222. — (3) Quoting system changed; actual prices are generally 3 Pf. higher than according to the ancient  
 system used in Kempten. — (4) Average calculated from the prices for the Fridays and the Thursdays which precede. —  
 (5) Average price for all qualities.

## SUPPLEMENT TO MONTHLY PRICE TABLE

DATE	BRAILA (lei per 100 kg.)				LE HAVRE Am. Middling (francs per 50 kg.)
	Wheat	Barley	Oats	Maize	
December 4, 1931 . . . . .	—	—	—	—	206
" 11, " . . . . .	—	—	—	—	205
" 18, " . . . . .	—	—	—	—	207
" 24, " . . . . .	—	—	—	—	213
" 31, " . . . . .	—	—	—	—	221
Average December 1931 . . . . .	—	—	—	—	210
January 8, 1932 . . . . .	285	280	315	170	210
" 15, " . . . . .	295	275	325	167	224
" 22, " . . . . .	295	277	325	160	233
" 29, " . . . . .	282	260	305	154	223
Average January 1932 . . . . .	292	273	317	162	224
February 5, 1932 . . . . .	280	260	295	162	226
" 12, " . . . . .	285	265	287	171	227
" 19, " . . . . .	290	287	287	170	237

## IMPORT DUTIES ON CEREALS AND FLOUR

## CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGES 160 TO 163 OF THE CROP REPORT FOR FEBRUARY  
(SEE ALSO THE SAME HEADING IN THE CROP REPORTS FOR JANUARY AND FEBRUARY).

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Germany . . . . .	Wheat imported under customs control for the manufacture of starch and hard wheat imported under c. c. for the manufacture of groats (1) . .	1st April	R. M. 14.00	90.76
" . . . . .	Wheat other (1) . . . . .	"	" 30.00	184.47
" . . . . .	Rye (1) . . . . .	"	" 30.00	181.51
" . . . . .	Barley for stock feeding (under customs control) (2) . .	"	" 20.00	108.72
" . . . . .	Barley other (2) . . . . .	"	" 25.00	129.65
" . . . . .	Wheat- and rye flour . . . . .	"	" 65.00	1,376.50
France . . . . .	Wheat- and rye flour . . . . .	14 February	(3)	(3)
Great Britain and N. Ireland	Rye, barley, oats, wheat- and rye flour . . . . .	1st March	10 % ad valo-rem (4)	10 % ad valo-rem (4)
Hungary . . . . .	Maize . . . . .	6 March	(5)	(5)
Latvia . . . . .	Wheat . . . . .	11 February	(6)	(6)
" . . . . .	Rye, barley, oats, maize, wheat- and rye flour . .	18 February	(7)	(7)
Portugal . . . . .	Wheat, rye, wheat- and rye flour . . . . .	26 February	(8)	(8)
" . . . . .	Barley . . . . .	"	esc. 58.68	(9) 40.50
" . . . . .	Oats . . . . .	"	" 58.68	(9) 27.00
" . . . . .	Maize . . . . .	"	" 44.00	(9) 35.43
Czechoslovakia . . . . .	Rye (supplementary duty) . . . . .	1st March	Cz. cts. 20.00	15.24
" . . . . .	Wheat and rye flour (supplementary duty) . . . .	"	" 54.00	144.02

(1) For imports from Poland. — (2) For imports from Poland and Canada. — (3) No change in duties but all imports of foreign wheat- and rye flour are conditional on the presentation to the customs of a nominative and non-transferable import licence stating the quantity for which it is valid. — (4) Excepting goods consigned from and grown in the British Empire. — (5) Import prohibited. — (6) No change in duties but import is limited to 250,000 quintals (981,578 bushels) annually. — (7) No change in duties but import limited for each product enumerated to 75 % per annum of the quantities imported in 1931. — (8) Import duties for all products increased by 20 %, an increase to be taken into account in case of import of the products stated. — (9) On the basis of exchange rate of 26 February (109  $\frac{1}{4}$  escudos = £ 1; 1 escudo = \$c. 3.17).

## THE PRICES OF AGRICULTURAL PRODUCTS IN FEBRUARY 1932

In the following pages the index-numbers of prices of agricultural products and other price-indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled "Index-numbers of prices of agricultural products and other price-indices of interest to the farmer". We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilisation from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary tables is given below.

COUNTRIES	Percentage variations in the index-numbers for February, 1932			
	compared with those for January, 1932		compared with those for February, 1931	
	Index-numbers of prices of agricultural products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany . . . . .	+ 2.7	— 0.2	— 10.7	— 12.5
England and Wales . . . . .	— 4.1	+ 2.4	— 7.1	+ 1.4
Argentina . . . . .	+ 3.6	—	— 3.6	—
Canada . . . . .	+ 0.2	— 0.3	— 14.4	— 8.9
Estonia . . . . .	+ 2.6	—	— 17.9	—
United States . . . . .	— 4.8	—	— 33.3	—
Finland . . . . .	— 4.2	— 1.5	— 27.8	— 12.2
Hungary . . . . .	0.0	— 1.1	+ 5.4	+ 8.1
Italy . . . . .	+ 1.1	+ 1.0	+ 12.5	+ 7.6
New Zealand . . . . .	— 0.3	— 0.7	+ 1.7	— 9.6
Netherlands . . . . .	+ 1.6	—	— 11.1	—
Poland . . . . .	+ 1.9	— 1.1	— 23.6	— 20.2
Yugoslavia . . . . .	+ 5.2	+ 1.1	— 6.4	— 10.4
	c) + 1.9	— 0.7	c) — 4.4	— 10.0
	d) — 4.8		d) — 26.2	

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

# INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER \*

COUNTRIES AND CLASSIFICATION	Febr.	Jan.	Dec.	Nov.	Oct.	Sept.	Febr.	Febr.	Year	
	1932	1932	1931	1931	1931	1931	1931	1930	1931	1930
<b>GERMANY</b>										
(Statistisches Reichsamt)										
1913 = 100.										
Foodstuffs of vegetable origin . . . . .	119.5	115.3	112.8	115.6	112.5	111.7	114.1	111.7	119.3	115.3
Livestock . . . . .	65.7	65.7	68.4	71.4	76.9	84.7	90.6	122.9	83.0	112.4
Livestock products . . . . .	95.5	92.1	101.1	107.4	106.7	108.4	119.9	128.5	108.4	121.7
Feeding stuffs . . . . .	93.5	92.0	93.6	98.7	95.5	96.8	93.0	88.4	101.9	93.2
Total agricultural products . . . . .	94.6	92.1	94.5	98.5	98.5	101.1	105.9	116.0	103.8	113.1
Fertilizers . . . . .	72.0	71.3	70.4	72.1	74.0	73.6	83.1	86.0	76.5	82.4
Agricultural dead stock . . . . .	113.9	122.6	128.3	128.6	129.5	129.7	133.3	140.8	130.7	139.4
Finished manufactures ("Gebrauchsgüter") . . . . .	123.6	126.9	132.4	134.2	135.8	137.8	145.0	166.1	140.1	159.3
General index-number . . . . .	99.8	100.0	103.7	106.6	107.1	108.6	114.0	129.3	110.9	124.6
<b>ENGLAND AND WALES</b>										
(Ministry of Agriculture)										
Average of corresponding months										
1911-13 = 100.										
Agricultural products . . . . .	117	122	117	112	113	120	126	144	120	134
Feeding stuffs . . . . .	97	95	98	97	83	76	77	105	83	96
Fertilizers . . . . .	91	91	91	90	89	88	100	102	96	101
General index-number (1). . . . .	102.0	99.6	100.5	97.6	96.8	94.9	100.6	123.3	97.7	114.1
<b>ARGENTINA (2)</b>										
(Banco de la Nación Argentina)										
1926 = 100.										
Cereals and linseed . . . . .	59.1	55.8	58.2	65.6	63.3	62.7	54.5	93.2	55.8	82.3
Meat . . . . .	72.3	72.2	77.1	84.3	90.8	100.0	93.9	110.5	91.8	110.9
Hides and skins . . . . .	61.8	62.7	59.1	66.3	61.5	53.4	70.0	74.0	64.5	71.6
Wool . . . . .	49.4	49.1	51.7	58.0	60.3	54.3	72.9	70.0	61.2	67.4
Dairy products . . . . .	58.9	58.8	66.6	70.7	74.2	75.8	72.9	95.9	74.5	82.4
Forest products . . . . .	78.3	79.3	80.5	81.7	83.5	89.5	108.7	106.8	99.3	107.9
Total agricultural products . . . . .	61.0	58.9	61.4	68.6	67.7	61.3	63.3	93.2	63.3	85.5
<b>CANADA (2)</b>										
(Internal Trade Branch										
of the Dominion Bureau of Statistics)										
1926 = 100.										
Field products (grain, etc.) . . . . .	43.7	42.0	42.2	46.0	44.0	41.1	45.0	85.2	44.6	70.0
Animals and animal products . . . . .	66.2	68.8	71.1	72.1	72.1	72.5	87.5	118.0	77.8	102.9
Total Canadian farm products . . . . .	52.1	52.0	53.0	55.8	54.5	52.8	60.9	97.5	57.0	82.3
Fertilizers . . . . .	72.0	71.0	71.1	75.5	75.5	74.8	80.4	81.6	88.0	88.2
Consumer's goods (other than foodstuffs, etc.) . . . . .	...	79.8	79.9	79.8	79.9	80.1	82.5	89.4	80.5	86.8
General index-number . . . . .	69.2	69.4	70.3	70.6	70.4	70.0	76.0	93.0	72.6	86.6
<b>ESTONIA</b>										
(Central Bureau of Statistics)										
1913 = 100.										
Commodities imported (3). . . . .	112	117	125	124	127	129	123	123	129	118
Commodities exported . . . . .	64	60	64	70	70	75	82	119	78	103
Agricultural products imported and exported (3) . . . . .	78	76	81	85	86	90	95	120	91	108

\* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930), as well as to pages 77 to 79 of the "Crop Report" of January 1932.

(1) Calculated by the "Statist", reduced to base-year 1913 = 100. — (2) Average data for the year 1931 are provisional. — (3) From January 1932 the price of rye is excluded from the calculations.

COUNTRIES AND CLASSIFICATION	Febr.	Jan.	Dec.	Nov.	Oct.	Sept.	Febr.	Febr.	Year	
	1932	1932	1931	1931	1931	1931	1931	1930	1931	1930
<b>UNITED STATES</b> (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals . . . . .	51	52	52	57	46	50	75	115	68	100
Fruits and vegetables . . . . .	68	70	68	68	70	83	109	168	98	158
Meat animals . . . . .	65	68	68	76	79	86	106	160	98	134
Dairy products . . . . .	79	85	92	95	95	92	101	129	94	123
Poultry and poultry products . . . . .	70	87	120	123	110	99	79	154	96	126
Cotton and cottonseed . . . . .	47	45	45	50	42	47	76	121	68	102
Total agricultural products . . . . .	60	63	66	71	68	72	90	131	80	117
Commodities purchased by farmers (1) . . . . .	...	121	123	123	126	127	137	152	129	146
Agricultural wages (1) . . . . .	—	98	—	—	113	—	(2) 129	(2) 159	116	152
<b>UNITED STATES</b> (Bureau of Labor) 1926 = 100.										
Grains . . . . .	48.1	46.7	47.0	51.3	44.3	44.2	60.4	89.0	53.0	58.3
Livestock and poultry . . . . .	50.3	53.4	51.7	55.7	57.6	61.0	69.6	101.3	63.9	89.2
Other farm products . . . . .	52.7	54.8	61.2	63.1	64.2	65.4	73.7	98.9	69.2	91.1
Total farm products . . . . .	50.6	52.8	55.7	58.7	58.8	60.5	70.1	98.0	64.8	88.3
Agricultural implements . . . . .	85.1	85.5	92.1	92.1	92.3	94.5	94.7	96.1	94.0	95.1
Fertilizer materials . . . . .	69.8	69.9	70.1	70.1	70.2	74.2	81.1	89.5	76.8	85.6
Mixed fertilizers . . . . .	73.7	75.5	77.1	77.7	77.2	77.6	89.1	96.2	82.0	93.6
Cattle feed . . . . .	48.2	53.0	53.9	59.8	49.4	44.4	71.6	107.5	62.7	99.7
Non-agricultural commodities . . . . .	69.6	70.3	69.3	71.0	71.2	71.7	77.1	90.6	73.0	85.9
General index-number . . . . .	66.3	67.3	66.3	68.3	68.4	69.1	75.5	92.1	71.1	86.3
<b>FINLAND</b> (Central Bureau of Statistics) 1926 = 100.										
Cereals . . . . .	94	96	93	81	78	70	74	81	77	76
Potatoes . . . . .	68	68	54	49	49	59	68	101	68	76
Fodder . . . . .	71	73	71	62	58	52	62	64	63	62
Meat . . . . .	63	57	57	51	54	59	73	96	64	88
Dairy products . . . . .	84	90	92	88	77	72	75	92	76	84
Total agricultural products . . . . .	78	78	78	72	67	66	74	88	72	82
General index-number . . . . .	93	94	92	87	82	79	86	93	84	90
<b>HUNGARY</b> (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products . . . . .	90	89	89	89	88	88	80	93	—	—
General index-number . . . . .	99	98	99	99	97	96	92	104	—	—
<b>ITALY</b> (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products . . . . .	349.57	350.71	342.35	336.84	337.20	334.23	343.75	464.40	343.11	413.39
General index-number . . . . .	323.49	325.92	325.54	323.74	329.85	330.33	357.92	444.54	341.57	411.04
<b>NEW ZEALAND</b> (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce . . . . .	90.8	91.5	91.5	102.6	106.9	102.9	102.0	135.9	99.3	120.7
Meat . . . . .	118.5	122.8	137.8	113.1	119.6	120.7	142.4	173.2	129.2	164.7
Wool . . . . .	64.9	66.8	61.7	66.2	61.6	63.0	55.7	103.1	67.7	100.7
Hides, skins, and tallow . . . . .	75.1	72.1	67.0	67.9	60.0	79.8	96.0	163.7	82.7	145.4
Miscellaneous . . . . .	138.0	112.3	135.8	93.1	123.1	109.8	122.9	135.0	127.4	134.0
Total agricultural products . . . . .	86.4	85.0	94.8	97.8	101.2	99.7	97.2	133.2	96.8	123.7

(1) 1910-14 = 100. — (2) January.

COUNTRIES AND CLASSIFICATION	Febr. 1932	Jan. 1932	Dec. 1931	Nov. 1931	Oct. 1931	Sept. 1931	Febr. 1931	Febr. 1930	Year	
									1931	1930
<b>NORWAY</b> (Kgl. Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals . . . . .	122	123	110	110	106	111	104	138	(1) 114	(1) 155
Potatoes . . . . .	140	137	126	119	109	97	181	119	(1) 152	(1) 120
Pork . . . . .	93	95	90	88	92	86	84	140	(1) 98	(1) 141
Other meat . . . . .	120	113	126	121	127	137	182	208	(1) 198	(1) 16
Eggs . . . . .	87	90	114	132	125	117	101	124	(1) 121	(1) 13
Dairy products . . . . .	130	129	136	133	131	127	138	156	(1) 150	(1) 167
Concentrated feeding stuffs . . . . .	108	109	108	102	97	97	103	133	(1) 117	(1) 142
Maize . . . . .	83	86	85	81	73	71	81	124	(1) 103	(1) 14
Fertilizers . . . . .	91	91	86	86	81	81	96	106	(1) 101	(1) 107
<b>NETHERLANDS</b> (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil . . . . .	60	58	57	59	58	57	66	56	(2) 67	(2) 68
Animal products . . . . .	54	53	53	57	58	64	74	93	(2) 77	(2) 95
Total agricultural products . . . . .	55	54	54	58	58	62	72	84	(2) 75	(2) 88
Agricultural wages . . . . .	95	95	95	95	95	95	100	100	(2) 99	(2) 100
General index-number (3) . . . . .	56.2	56.8	57.4	60.2	60.2	61.6	70.4	85.3	65.7	79.2
<b>POLAND (4)</b> (Central Bureau of Statistics) 1927 = 100.										
Products of the soil . . . . .	53.8	52.7	58.0	59.1	51.0	40.6	45.8	51.8	53.0	52.1
Products of agricultural industry . . . . .	64.5	62.6	66.2	68.7	61.8	60.1	59.8	67.9	65.9	60.9
Total products of plant origin . . . . .	50.3	57.8	62.4	64.2	56.6	53.3	52.6	59.4	60.0	60.5
Animals . . . . .	37.8	37.5	41.3	43.7	47.5	50.3	53.0	80.3	55.8	82.4
Dairy products . . . . .	68.5	56.9	68.0	76.9	66.3	63.3	80.1	82.4	68.0	81.5
Total products of animal origin . . . . .	40.5	45.4	51.8	56.4	55.3	61.3	67.7	80.2	60.8	81.9
Total agricultural products . . . . .	54.5	51.8	57.2	60.3	55.6	56.2	58.2	69.3	59.7	66.5
Fertilizers . . . . .	94.1	108.4	108.4	118.5	118.5	118.5	124.7	130.6	120.2	127.8
Industrial products . . . . .	73.0	74.4	74.0	74.5	75.3	76.0	83.9	98.2	79.4	94.0
General index-number . . . . .	64.6	63.9	66.4	68.2	66.3	67.0	72.1	84.0	70.5	82.3
<b>YUGOSLAVIA</b> (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil . . . . .	70.3	69.0	70.6	70.9	71.1	70.4	73.5	100.7	74.3	89.3
Animal products . . . . .	57.6	60.5	58.6	63.6	66.1	70.6	78.1	97.1	72.2	96.3
Industrial products . . . . .	68.8	69.2	68.5	68.7	69.3	72.2	72.1	85.0	71.4	81.8
General index-number . . . . .	67.3	67.8	67.2	68.6	69.5	71.6	74.8	92.1	72.9	86.0

(1) Agricultural year April 1-March 31. — (2) Agricultural year July 1-June 30. — (3) Calculated by the Central Statistics Bureau of the Netherlands, reduced to the base 1925-1929 = 100. — (4) Average data for the year 1931 are provisional.

## RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	March	March	March	Feb.	Average						
	18,	11,	4,	26,	Feb.	March	March	Commercial			
	1932	1932	1932	1932	1932	1931	1930	Season	1930-31	1929-30	
SHIPMENTS OF WHEAT AND MAIZE.											
Danube to Antwerp/Hamburg . . . . .	14/0	n. 14/6	14/6	14/9	n. 14/7	13/9	13/8		13/11	15/8	
Black Sea to Antwerp/Hamburg . . . . .	(shill. per 2240 lbs.) n. q.	n. 11/6	11/6	n. q.	11/-	10/7	n. q.		10/10	n. q.	
St. John to Liverpool (1) . . . . .	1/9	1/9	1/6	1/6	1/6	1/6	1/4		1/8	1/5	
Montreal to United Kingdom . . . . .	(shill. per n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.		1/10	1/10	
Gulf to United Kingdom . . . . .	480 lbs.) (1) 2/3	(2) 0.11 1/2	(1)(2) 0.12	1)2/ 0.12	1)2/ 0.12	2/-	2/3		2/3	2/6	
New York to Liverpool (1) . . . . .	1/6	1/6	2/-	2/-	1/10	1/6	1/4		1/6	1/6	
Northern Range to U.K. and Continent	n. q.	n. q.	(2) 0.09	(n. q.	2)n. 0.13	1/10	1/9		1/9	1/9	
North Pacific to United Kingdom (sh. per 2240 lbs.) .	24/-	24/-	n. 23/6	23/6	23/1	21/10	18/9		22/8	22/7	
Vancouver to Yokohama (1) (gold \$ per sh. ton) . .	2.35	2.35	2.35	2.50	2.56	2.75	2.50		2.72	2.78	
La Plata Down River (3) to U. K./Continent	17/-	17/3	17/6	18/-	17/7	16/11	9/10		16/4	12/8	
La Plata Up River (4) to U. K./Continent	18/6	19/-	19/-	19/8	18/11	18/7	11/4		18/-	14/4	
Karachi to U. K./Continent (5) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	19/9	n. q.		19/8	n. 15/4	
Western Australia to U.K./Continent .	27/0	28/6	30/-	29/-	27/7	29/4	20/11		29/8	25/7	
SHIPMENTS OF RICE.											
Saigon to Europe . . . . .	(shill. per (1) 22/6	(1) 22/6	(1) 22/-	1)n. 21/6	(1) 21/6	24/10	n. 21/6		24/3	n. 18/11	
Burma to U.K./Continent . . . . .	2240 lbs.) n. q.	n. q.	25/6	26/6	24/8	24/1	17/9		23/9	n. 17/8	

(1) Rates for parcels by liners. — (2) Freight in gold \$ per 100 lbs. — (3) "Down River", includes the ports Buenos Aires and La Plata. — (4) "Up River" includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight. — (5) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs.

## EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	March 18, 1932	March 11, 1932	March 4, 1932	February 26, 1932
Germany . . . . .	Berlin	—	0.4	—	0.4
Argentina . . . . .	New York	—	39.3	—	39.3
Belgium . . . . .	Brussels	+	0.5	+	0.4
Canada . . . . .	New York	—	10.6	—	11.8
Denmark . . . . .	Copenhagen	—	25.9	—	28.3
Egypt . . . . .	London	—	25.6	—	28.0
France . . . . .	Paris	+	0.5	+	0.4
Great Britain . . . . .	London	—	25.6	—	28.0
Hungary . . . . .	Budapest	—	0.0	—	0.0
India . . . . .	London	—	25.6	—	27.5
Indo-China . . . . .	Paris	+	0.5	+	0.4
Italy . . . . .	Milan	—	1.6	—	1.3
Japan . . . . .	New York	—	35.6	—	34.5
Netherlands . . . . .	Amsterdam	+	0.2	+	0.1
Rumania . . . . .	New York	—	0.2	—	0.2

(1) The percentage represents the premium or the loss as far as possible on the national exchange. On page 228 may be found the table of reciprocal parities of the currencies considered; by the aid of this table and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Crop Report refer.

**RECIPROCAL PARITIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN  
THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).**

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	Canada	Denmark	Egypt	France	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Rumania	Czechoslovakia	Former Latin monetary union (3)
Germany	Reichsmark	1	0.561	8.566	0.288	0.889	4.819	6.080	0.979	1.982	0.653	4.526	0.478	0.593	2.123	39.825	8.040	1.235
Argentina	Paper peso	1.782	1	15.263	0.424	1.584	8.586	10.883	1.744	2.427	1.163	8.064	0.851	1.056	3.872	70.959	14.326	2.200
Belgium	Franc	0.117	0.065	1	0.028	0.104	0.563	0.710	0.114	0.159	0.076	0.528	0.056	0.069	0.248	4.049	0.989	0.145
Canada	Dollar	4.193	2.366	35.969	1	3.791	20.230	25.524	4.110	5.718	2.740	19.000	2.006	2.488	8.014	107.181	38.751	5.183
United States																		
Denmark	Crown	1.125	0.631	9.637	0.208	1	5.422	6.840	1.101	1.532	0.734	5.092	0.536	0.667	2.389	44.803	9.045	1.389
Sweden																		
Egypt	Piastre	0.207	0.016	1.777	0.049	0.184	1	1.262	0.308	0.283	0.135	0.939	0.099	0.123	0.441	8.264	1.668	0.256
France	Franc	0.164	0.092	1.409	0.039	0.145	0.793	1	0.161	0.224	0.107	0.744	0.079	0.097	0.349	6.550	1.322	0.203
Indo-China	Piastre (2)																	
Great Britain	Shilling	1.021	0.573	8.760	0.243	0.998	4.923	6.211	1	1.391	0.667	4.623	0.488	0.605	2.169	40.680	8.218	1.261
Hungary	Pengő	0.784	0.412	6.289	0.175	0.653	3.580	4.464	0.720	1	0.479	3.923	0.851	0.435	1.559	29.240	5.002	0.906
India	Rupce	1.582	0.860	13.125	0.305	1.392	7.384	9.316	1.600	2.087	1	6.935	0.732	0.908	3.254	61.020	12.319	1.892
Italy	Lira	0.221	0.124	1.892	0.053	0.196	1.045	1.343	0.216	0.301	0.144	1	0.106	0.131	0.469	8.799	1.776	0.273
Japan	Yen	2.092	1.174	17.924	0.498	1.890	10.084	12.723	2.049	2.850	1.399	9.471	1	1.240	4.448	83.883	16.824	2.583
Netherlands	Florin	1.687	0.947	14.464	0.402	1.450	8.192	10.260	1.652	2.298	1.101	7.637	0.806	1	3.583	67.200	13.567	2.083
Poland	Zloty	0.471	0.261	4.094	0.112	0.419	2.269	2.863	0.461	0.641	0.307	2.131	0.225	0.279	1	18.755	3.786	0.581
Rumania	Lei	0.025	0.014	0.215	0.006	0.022	0.121	0.153	0.025	0.034	0.016	0.114	0.012	0.015	0.053	1	0.202	0.031
Czechoslovakia	Crown	0.124	0.070	1.005	0.030	0.111	0.599	0.756	0.122	0.169	0.081	0.563	0.059	0.074	0.264	4.953	1	0.154
Former Latin monetary union (3)	Gold Franc	0.310	0.455	6.998	0.193	0.720	3.903	4.925	0.793	1.103	0.529	3.666	0.387	0.430	1.720	32.258	6.512	1

(1) Each figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) 1 Gold piastre equal to 10 francs. — (3) Data for purpose of comparison.



# MONTHLY CROP REPORT

## AND AGRICULTURAL STATISTICS

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*The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.*

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1932

No. 4

### MARKET SITUATION AND CROP PROSPECTS FOR CEREALS

The statistical situation for the present season was examined at length last month and it is useless to cover this ground again since the main elements have undergone no important change in the meantime. The figures recently published of total stocks of Canadian wheat on 1 April confirm the estimates of exportable quantities and probable consumption in that country. In any case the statistical position in the current season will not determine market fluctuations in the coming months, the carryover to the next season being now approximately evaluated and its possible variation having only a very small potential influence. The essential element in the orientation of the market is the estimate of the total of the new crop; such estimates, however, as are now beginning to be formulated on the basis of the appearance of the crops in the ground, will undergo frequent modifications in accordance with the changes in the weather from now to the harvest. At a date so early in the year as this it would be useless to pretend to make any deep judgement on the results of the current agricultural season, all the more so because the extent even of the areas cultivated and the condition of the crops are not known for certain countries and for others only to an uncertain extent. According to the general impression there will be an increase of some hundred thousand acres in sowings of autumn wheat while those of rye will undergo a decrease of the same order. The area damaged by winter conditions, however, seems to be considerably greater than last year so that it is possible that the areas on which the winter wheat crop will be harvested next summer will be a little smaller than in 1931; as regards rye the reduction should be more considerable. It is not possible to give any general indication of the total area now being sown to spring wheat in the northern hemisphere; according to the intentions of farmers spring sowings in the United States will be greatly increased; it is very probable that this example will be followed in Canada. The U. S. S. R. is experiencing very serious difficulties in the collection and distribution of the seed necessary for sowing and it appears that it will not succeed in wholly covering the area planned in its official programme.

In the southern hemisphere the land is now being prepared for sowings. The area in Argentina and Australia will be very much influenced by crop prospects in the northern hemisphere and the prices at the date of sowing. It would therefore seem for all these reasons premature to express an opinion at the present time on the probable area

of wheat and rye for the coming crop. Nothing definite can yet be said as to crop condition ; in Europe the extent of the damage due to the long and unusually severe winter cannot yet be stated. It appears, however, that the damage has exceeded the normal only in some countries in the east. The situation is very satisfactory in the majority of western European countries and particularly in France and Italy, which are the two principal producing countries on the continent. The prospect of an abundant European wheat crop, larger than that of 1931 cannot be excluded from consideration this year.

In the United States the winter has not been favourable to autumn wheat, frosts having caused great losses of sowings. Though the estimate of area damaged by winter conditions is not made until May some indication of the area that can be harvested may be deduced from the information supplied by farmers ; the latter expected on the basis of conditions at 1 April that about 33.3 million acres would be harvested out of the 38.6 million acres sown last autumn. Consequently the area abandoned through winter damage (14 %) would be much greater than in preceding years. The unfavourable

*Winter wheat in the United States.*

Year of production	Area		% of area sown not harvested	Crop condition April 1
	sown	harvested		
	(thousand acres)			
1932 . . . . .	38,682	(1) 33,287	14.0	75.8
1931 . . . . .	43,140	41,009	5.0	88.8
1930 . . . . .	43,630	39,500	9.4	77.4
1929 . . . . .	43,840	40,580	6.4	82.7
1928 . . . . .	47,317	36,213	23.5	68.8
1927 . . . . .	43,373	37,723	13.0	84.5
1926 . . . . .	39,887	36,987	7.3	84.1
1925 . . . . .	39,951	31,346	21.5	68.7
1924 . . . . .	38,916	35,656	8.4	83.0
1923 . . . . .	46,091	39,508	14.3	75.2
1922 . . . . .	47,930	42,358	11.6	78.4
1921 . . . . .	45,825	43,414	4.8	91.0

(1) Acreage which farmers expect to harvest, on the basis of the situation on March 1.

influence of the winter is reflected in crop condition on 1 April, which was one of the poorest recorded in the last ten years. Calculations of probable production on this basis give a figure of about 453 million bushels, which is an extremely poor crop in comparison with that of last year and the average of the five years preceding that. It would seem, however, that much greater weight than is legitimate has been given to the estimate of crop condition on 1 April and to this calculation of probable production. An absolute value has in fact been given to this figure of probable production, which has been made the basis of rough calculations of future available supplies in the United States, despite the fact that it is far from being a real estimate of the crop and that it can have no other value than as a very general and vague indication. The only conclusion that might justifiably be drawn from it would be that the possibility of a superabundant crop of winter wheat in the United States must be excluded. It is not possible on 1 April to forecast the results of a crop that still remains highly subject to weather conditions in the following months ; the crop may be very much greater or very much less than the amount indicated by condition on 1 April. The year 1928 may in this connection furnish an example : on 1 April crop condition of winter wheat was estimated at 68.8, distinctly inferior to that of the current year ; April 1928 was an unfavourable month and prices at Chicago rose in consequence of the continual complaints about the crop from 144 to 168 cents between the beginning and the end of the month ; weather in May and June

however, was favourable and the crop was good, yield per acre being one of the best recorded in the United States. Similarly, this year the wheat market has been sensitive to the probability of a small winter wheat crop in the United States and in a few days the price at Chicago increased by about 10 %. A recovery in wheat prices would be welcomed by all but it can be permanently assured only by a real equilibrium between supply and demand. A rise in prices at this time of year has the risk, however, of being only temporary, since it leads to an extension of the spring sowings in progress in North America and also of those in the southern hemisphere, which reach their maximum next month. To return to our example, the rise in prices in April 1928 was followed by an increase of sowings in Canada on nearly 2 million acres, in the United States of 1 million and in Argentina and Australia of 3 millions acres.

Turning to India, production in the Punjab is now known ; this area furnishes nearly one-third of the crop, of which the first estimate will be published at the end of this month.

*Production of wheat in India.*

Year of production	First estimate				Final estimate			
	Punjab		India		Punjab		India	
	ooo centals	ooo bushels	ooo centals	ooo bushels	ooo centals	ooo bushels	ooo centals	ooo bushels
1932 . . . . .	75,130	125,216	...	...	...	...	...	...
1931 . . . . .	81,267	135,445	208,074	346,789	79,744	132,907	208,365	347,274
1930 . . . . .	87,853	146,421	220,976	368,293	94,259	157,089	234,506	390,843
1929 . . . . .	69,171	115,285	184,419	307,365	76,675	127,792	192,438	320,731
1928 . . . . .	74,144	123,573	198,688	331,147	61,914	103,189	174,518	290,864
1927 . . . . .	70,224	117,040	194,925	324,875	76,854	128,091	200,995	331,992
1926 . . . . .	64,015	108,192	192,237	320,395	75,757	126,261	194,790	324,651
1925 . . . . .	65,565	103,275	193,178	321,963	66,774	111,391	198,598	330,997

Despite the drought during the first months of the year the crop in the Punjab is very satisfactory ; as regards the rest of India a crop perhaps a little inferior to that of 1931 is expected, as the season has not allowed the full results of the increase in area sown to be obtained (1).

In North Africa weather conditions have favoured the crop, which benefited in March and in the early part of April from very propitious rains. It is expected that, apart from damage due to the scirocco at the end of the season, abundant crops will be obtained in the three countries of the west and particularly in Morocco and Tunisia. In Egypt normal yields are expected. In Argentina and Australia weather has favoured preparations for sowings. According to information received at the last moment, the area to be sown in Australia this year will be about 15.5 million acres compared with 14.5 million last year.

G. C.

## CEREALS

*Germany :* The latter part of the winter was characterized by intense and prolonged cold which in places caused damage to the young crops. Precipitation in the past winter was relatively small so that for a very long time snow cover was lacking. Owing to the prolonged cold growth is backward. As far as the melting of the snow made it

(1) At the last moment there has been received the first estimate of wheat production in India of 208.6 million centals (347.6 million bushels).

possible to judge, crop condition at the beginning of April was less satisfactory than at the corresponding date last year and at the beginning of December 1931. For the condition of wheat, rye and winter barley see table. Crop condition of winter spelt at the beginning of April was 3.1 against 2.7 at the beginning of December 1931 and 2.8 at the beginning of April 1931. Preparations for spring sowings could be begun only in areas favoured by situation.

*Austria* : The clear cold weather of the previous month was interrupted for a short time toward the end of the first decade of March. After the heavy snowfall on the northern Alps the temperature fell again. Towards the middle of the month there were violent winds and further snow. At the beginning of the third decade the weather again cleared, temperature remaining, however, below normal until the last days of the month, when it rose rapidly. As the soil was severely frozen it was unable to absorb the water from the snowmelt.

Winter wheat is generally little developed, rye has lost all its freshness and winter barley is thin and brownish. All crops are very late.

During the warmer days toward mid-March preparations for spring sowings were begun but owing to the unfavourable weather they had to be interrupted and could not be renewed until toward the end of the month. So far only a little barley and oats had been sown.

*Belgium* : March was characterised by dry, cold weather with prevalence of north and north-east winds ; severe night frosts alternated with sunny days. In many areas lack of water began to be felt. The cold dry weather considerably retarded growth. The rains in the last days of the month were very beneficial. Winter cereals suffered greatly from the cold. Sowings of oats began. Sowings are appearing very slowly.

*Bulgaria* : Weather in March was cold. Winter cereals, particularly barley, suffered some losses by frost. Snow fell in abundance and protected them from the severity of the season but hindered the commencement of work in the fields.

*Estonia* : At the beginning of April the snow began to melt but the ground was still frozen ; preparations for spring crops had not yet begun.

*Irish Free State* : Cultural operations for spring sowings were carried out under very good conditions in March, but sowings were begun only in the earlier and more favoured districts. The weather was exceptionally dry and was also cold but no serious damage to crops was reported.

*France* : Rainfall in the first week of April, interrupting the long period of dry weather in the preceding months, was very beneficial to sown crops. The appearance of winter cereals is generally good and gives rise to hopes of good crops, especially of wheat; it is reported locally, however, in some eastern areas that black oats sown in January have been so damaged as to necessitate re-sowing. The rather intense winter cold seems generally not to have caused any serious damage and in fact has so far checked the growth of weeds. Towards April 10, milder weather was desired to assure the good growth of winter cereals and especially the regular sprouting of spring sowings. The latter have been effected under excellent conditions and in particularly well prepared land ; timely rains have been very beneficial. In various regions some extension of barley sowings is reported.

*Great Britain and Northern Ireland* : The weather in March was on the whole fine and dry ; rain was generally welcome at the end of the month. Cultivation was carried out under favourable conditions and cereals have been sown rather earlier than usual.

Wheat is generally promising and progress of other crops is satisfactory. Reports indicate that rather more spring wheat has been sown this year in England and Wales. The area under oats in Northern Ireland this year is expected to be larger than in 1931.

*Hungary* : During the three weeks from March 9 to 30 temperatures were exceptionally low for the period of the year ; in northern areas, precipitation was smaller but in southern areas larger than the normal. Day temperatures were low and sharp night frosts occurred. Due to the abnormally dry and cold weather wheat sowings have generally wintered badly and their growth is making little progress due to the late spring ; late sown wheat is particularly weak. Winter rye has resisted better and is beginning to show some signs of greening. The damage caused to the crops by frost cannot yet be determined.

Tillage preparatory to sowing of spring cereals could not be begun until the last few days of March.

*Italy* : Temperature was below average in the first decade of March but rose subsequently ; in the South and in the Islands the rise was very considerable. At the end of the month vegetation of winter wheat was good, though late ; frost caused some losses. The situation of minor cereals is normal. Sowings of spring wheat are in progress.

*Lithuania* : On April 8 work for the spring sowings had not yet begun.

*Luxemburg* : Owing to frost damage it has become necessary to re-sow part of the winter crops.

Preparatory work for the spring sowings is being effected under average conditions ; sowing also has, in parts, been commenced under average conditions.

The area under meslin in 1932 is 10,000 acres against 9,000 in 1931 and 11,000, average of the five years 1926-30. Percentages 110.3 and 89.7. Crop condition at the beginning of April varied from good to average and was 2.7 according to the system of the country.

*Poland* : In respect to the estimate of last November the condition of sowings is worse. A relatively better condition of the sowings is reported in the eastern departments, while in the centre and in some parts in the west it is worse.

This improvement, generally small, is not yet determinative of ultimately better growth or of the probable crops. The general condition is undoubtedly due in great part to the unfavourable winter in the greater part of the country.

In the eastern part the thickness of the snow cover preserved sowings from the frosts though in the centre and in parts of the west a large part of the fields were almost entirely devoid of cover for a very long time.

The low temperature of March has had the same effect on the condition of sowings, which was below the multi-annual mean for that month. The slow melting of the snow contributed to delay in growth.

*Portugal* : March was generally favourable to cereal crops, which are well developed and in excellent condition.

*Rumania* : At the beginning of April in the departments of the north and west of Transylvania the snow had disappeared while in other regions a layer of varying thickness still covered the ground. It has therefore been impossible to begin work save in a few localities.

*Switzerland* : The winter cereal sowings have, for a long time, been exposed to cold winds and frosts. It is still not possible to form a judgement of crop condition. The

## Area and Crop Condition.

COUNTRIES	AREA SOWN				CROP CONDITION (h)								
	1931-32	1930-31	Average 1925-29 to 1929-30	% 1931-32	I-IV-1932			I-XII-1931			I-IV-1931		
					Thousand acres								
					1930-31 = 100	Aver. = 100		a)	b)	c)	a)	b)	c)
WINTER WHEAT.								a)	b)	c)	a)	b)	c)
Germany . . . . .	4,880	4,652	3,804	104.0	128.3	—	—	3.2	2.7	—	—	3.0	—
*Austria . . . . .	—	485	482	—	—	—	—	3.1	2.5	—	2.6	—	—
Belgium . . . . .	388	389	390	99.5	97.0	—	—	(r) e)	—	—	—	—	—
Bulgaria . . . . .	2,955	2,937	2,721	100.6	108.6	e)	—	—	—	—	d)	—	—
Spain (2) . . . . .	10,601	11,131	10,786	95.2	98.3	—	—	—	—	—	—	—	—
Finland . . . . .	30	32	26	92.3	112.3	—	—	—	—	—	—	—	—
France . . . . .	12,804	11,725	12,548	110.0	102.8	—	—	(3) 74	—	—	—	—	—
*Scotland . . . . .	—	50	57	—	—	115	—	(r) 115	—	—	—	—	—
Italy . . . . .	12,035	11,995 (1)	11,909	100.3	101.1	—	—	—	—	—	—	—	—
Lithuania . . . . .	376	410	264	91.7	142.6	—	—	—	—	—	—	—	—
Luxemburg (2) . . . . .	22	23	30	97.8	79.9	2.0	—	—	—	—	—	—	3.7
Poland . . . . .	4,000	4,494	3,255	80.0	122.0	—	—	—	—	—	(5) 3.0	—	—
*Rumania . . . . .	3,586	6,154	—	90.9	e)	—	—	(x) e)	—	—	c)	—	—
Switzerland . . . . .	125	125	122	100.0	102.4	—	—	90	—	—	—	—	94
*Czechoslovakia . . . . .	—	1,950	1,818	—	—	—	—	—	—	—	2.0	—	—
U. S. S. R. . . . .	32,337	20,010 (4)	21,400	111.4	132.2	—	—	—	—	—	—	—	—
Total Europe { m)	48,306	47,916	45,861	100.8	107.3	—	—	—	—	—	—	—	—
{ n)	80,612	76,956	70,221	101.8	114.7	—	—	—	—	—	—	—	—
Canada . . . . .	518	560	983	92.5	52.7	—	—	(b) 105	—	—	—	—	—
United States . . . . .	33,682	43,149	13,162	89.6	89.6	—	—	75.8	—	79.1	26.8	—	—
Total America . . . . .	39,200	43,709	14,145	89.7	88.8	—	—	—	—	—	—	—	—
India (7) . . . . .	33,907	31,582	30,918	107.1	109.6	—	—	—	—	—	—	—	—
*Japan . . . . .	—	1,231	1,185	—	—	f)	—	e)	—	—	—	—	g)
Syria and Lebanon . . . . .	1,191	1,168	1,118	102.0	106.5	—	—	(r) 102	—	—	—	—	—
Total Asia . . . . .	35,098	32,750	32,096	107.2	109.4	—	—	—	—	—	—	—	—
Algeria (2) . . . . .	(8) 3,534	3,640	3,798	97.1	94.5	110	—	(r) 110	—	—	—	100	—
Cyrenaica . . . . .	6	18	31	32.7	18.4	—	—	—	—	—	—	—	—
*Egypt (2) . . . . .	—	1,649	1,583	—	—	102	—	(3) 100	—	—	—	100	—
French Morocco (2) . . . . .	2,543	2,477	2,609	102.6	94.2	—	—	—	—	—	—	—	—
Tunis (2) . . . . .	2,100	1,977	1,778	106.2	118.1	120	—	(r) 120	—	—	120	—	—
Total Africa . . . . .	8,183	8,112	8,246	100.9	99.2	—	—	—	—	—	—	—	—
Grand Total: { m)	130,787	132,487	130,318	98.7	100.4	—	—	—	—	—	—	—	—
{ n)	163,124	161,521	154,778	101.0	105.4	—	—	—	—	—	—	—	—
WINTER RYE.													
Germany . . . . .	11,112	10,610	11,125	104.7	97.3	—	—	3.1	2.7	—	—	3.0	—
*Austria . . . . .	—	865	891	—	—	2.9	—	—	2.5	—	2.7	—	—
Belgium . . . . .	573	553	568	103.6	100.0	—	—	(r) e)	—	—	—	—	—
Bulgaria . . . . .	559	503	487	99.2	114.8	e)	—	—	—	—	d)	—	—
Spain . . . . .	1,400	1,546	1,658	95.0	88.6	—	—	—	—	—	—	—	—
Finland . . . . .	344	566	551	96.0	98.7	—	—	—	—	—	—	—	—
France . . . . .	1,791	1,744	1,899	102.7	94.3	—	—	(3) 74	—	—	—	—	—
Lithuania . . . . .	1,229	1,249	1,159	98.4	106.1	—	—	(3) 117	—	—	—	—	—
Luxemburg . . . . .	17	16	18	108.1	97.1	2.4	—	—	—	—	—	—	3.3
Poland . . . . .	14,200	14,201	13,966	100.4	101.9	—	—	—	—	—	—	(5) 2.9	—
*Rumania . . . . .	686	802	—	85.4	e)	—	—	(x) e)	—	—	c)	—	—
Switzerland . . . . .	46	46	48	100.0	95.5	—	—	94	—	—	—	—	90
*Czechoslovakia . . . . .	—	2,308	2,484	—	—	—	—	—	—	—	—	—	3.1
U. S. S. R. . . . .	64,765	69,353 (4)	60,227	93.4	93.6	—	—	—	—	—	—	—	—
Total Europe { m)	31,600	31,094	31,809	101.6	99.4	—	—	—	—	—	—	—	—
{ n)	96,765	100,147	101,036	95.9	95.4	—	—	—	—	—	—	—	—

COUNTRIES	AREA SOWN						CROP CONDITION (†)									
	1931-32	1930-31	Average		% 1931-32		I-IV-1932			I-XII-1931			I-IV-1931			
			1925-26 to 1929-30	1930-31	= 100	Aver. = 100										
Thousand acres																
Canada . . . . .	539	509	731	90.1	73.7	—	—	c)	a)	b)	c)	a)	b)	c)		
United States . .	3,712	3,003	3,856	93.0	96.3	—	—	79.0	—	—	(6) 94	—	—	—	—	81.6
Total America . .	4,251	4,592	4,587	92.6	82.7	—	—	—	—	—	—	—	—	—	—	—
French Morocco .	2	2	2	9.5	105.3	—	—	—	—	—	—	—	—	—	—	—
Grand Total . {m}	35,853	35,688	36,398	100.5	98.5	—	—	—	—	—	—	—	—	—	—	—
{n}	100,618	105,041	105,625	95.8	95.3	—	—	—	—	—	—	—	—	—	—	—
WINTER BARLEY.																
Germany . . . . .	583	561	444	103.9	131.4	—	—	3.1	2.6	—	—	—	—	2.9	—	—
*Austria . . . . .	...	18	23	...	...	2.9	—	2.5	—	—	—	—	—	2.8	—	—
Belgium . . . . .	78	70	73	111.2	106.6	...	...	(1) c)	—	—	—	—	—	—	—	—
Bulgaria . . . . .	489	483	460	101.3	108.4	c)	—	—	—	—	—	—	—	d)	—	—
Spain (2) . . . . .	4,553	4,543	4,481	100.2	101.6	—	—	—	—	—	—	—	—	—	—	—
France . . . . .	432	466	410	92.9	105.6	—	—	(3) 74	—	—	—	—	—	—	—	—
Luxembourg . . . .	10	11	9	89.9	114.1	2.8	—	—	—	—	—	—	—	(5) 3.0	—	—
Poland . . . . .	127	128	175	90.1	72.5	...	...	—	—	—	—	—	—	3.1	—	—
*Rumania . . . . .	245	248	—	98.7	—	c)	—	(e)	—	—	—	—	—	f)	—	—
Switzerland . . . .	18	18	16	100.0	110.0	—	—	93	—	—	—	—	—	—	—	94
*Czechoslovakia . .	...	16	12	...	...	—	—	—	—	—	—	—	—	—	—	—
U. S. S. R. . . . .	872	860 (4)	1,105	100.4	85.9	—	—	—	—	—	—	—	—	—	—	—
Total Europe {m}	6,290	6,280	6,068	100.2	103.6	—	—	—	—	—	—	—	—	—	—	—
{n}	7,162	7,149	7,083	100.2	101.1	—	—	—	—	—	—	—	—	—	—	—
*Japan (2) . . . . .	...	2,105	2,265	...	...	—	(f)	—	c)	—	—	—	—	—	—	g)
Syria and Lebanon	810	941	746	86.0	108.9	—	—	—	(1) c)	—	—	—	—	—	—	—
Algeria (2) . . . . .	3,225	3,178	3,505	101.5	92.0	120	—	—	(1) 110	—	—	—	—	—	—	—
Cyrenaica . . . . .	47	82	90	57.7	47.5	—	—	—	—	—	—	—	—	—	—	—
*Egypt (2) . . . . .	...	306	364	...	103	—	—	—	(3) 100	—	—	—	—	100	—	—
French Morocco . .	2,770	3,222	2,995	86.0	92.5	—	—	—	—	—	—	—	—	—	—	—
Tunis . . . . .	1,483	1,223	1,235	121.2	120.1	120	—	—	(1) 120	—	—	—	—	100	—	—
Total Africa . . .	7,525	7,705	7,834	97.7	96.1	—	—	—	—	—	—	—	—	—	—	—
Grand Total {m}	14,625	14,926	14,648	98.0	99.8	—	—	—	—	—	—	—	—	—	—	—
{n}	15,497	15,795	15,663	98.1	98.9	—	—	—	—	—	—	—	—	—	—	—
OATS.																
Spain . . . . .	1,826	1,940	1,902	94.1	98.0	—	—	—	—	—	—	—	—	—	—	—
France . . . . .	2,205	2,174	2,021	101.4	109.1	—	—	—	(3) 74	—	—	—	—	—	—	—
Luxembourg . . . .	74	75	72	98.9	102.9	—	—	3.0	—	—	—	—	—	—	8.0	—
Syria and Lebanon	27	27	42	99.5	64.8	—	—	—	(1) 102	—	—	—	—	—	—	—
Algeria . . . . .	494	557	605	88.7	81.7	110	—	—	—	—	—	—	—	—	—	—
French Morocco . .	63	60	82	106.0	77.2	—	—	—	—	—	—	—	—	—	—	—
Tunis . . . . .	74	72	109	103.4	67.9	120	—	—	(1) 120	—	—	—	—	100	—	—

\* Countries not included in the totals. — a) above the average. — b) average. — c) below the average. — d) very good. — e) good. — f) average. — g) bad. — h) very bad. — m) not including U. S. S. R. — n) including U. S. S. R. — (†) See explanation according to the various systems, page 229. — (1) 1st March 1932. — (2) Autumn and spring crop. — (3) 1st January 1932. — (4) Average 1928-29 and 1929-30. — (5) Toward the middle of the month. — (6) 1st November 1931. — (7) Production of 1931-32: 208,588,800 centals (342,648,000 bushels) against 208,074,000 (345,789,000 in 1930-31 and 198,240,000 (330,400,000), the average of the five years ending 1929-30. — (8) Area sown last year to 1st April 1930: 3,081,500 acres; 114.7%. — (9) Area sown as estimated in spring 1931 was 10% greater than that finally estimated (2,719,000 acres). — (10) Estimate of area sown last year as on 1 April 1931; 3,042,000 acres, 106%.

sowings are generally a little thin especially in late sown fields whereas earlier ones give a more favourable impression but are not completely satisfactory. In numerous regions, rye crops, due to the absence of a protective snow cover, have suffered from the north winds. This conditions may be considerably improved, however, in the near future if more favourable weather ensues.

Spring work has been considerably delayed by persistent frosts and has been continued actively only in the lower regions. Delay to sowings must in general be expected.

The few sowings effected at the end of March have not yet come up.

The crop condition of spelt on April 1, 1932, according to the Institute's system, was 92 against 94 at the same date of last year. Crop conditions of mixed grain were 92 and 93 respectively.

U. S. S. R. : According to information published by the Commissariat for Agriculture collection of seed for spring crops throughout the Union amounted on 1 April 1932 in the Kolkhozi to 94,199,000 centals (76.5 % of the quantity planned), for reserves 3,267,000 centals (30.4 % of the quantity planned) and on the individualistic holdings 4,938,000 centals (39.7 % of the quantity planned). Taking the three categories together the amount of seed collected is about 70 % of that planned.

In the separate regions and republics of the southern zone of the Union in which spring sowings had already begun by the end of March or would have been begun in the first half of April the percentages are as follows :

	Kolkhozi	Reserve	Individualistic holdings
	—	—	—
Transcaucasia . . . . .	53.2	47.0	23.3
Northern Caucasia . . . . .	89.0	—	96.0
Crimea . . . . .	110.3	120.0	16.7
Ukraine . . . . .	73.6	—	—
Region of Lower Volga . . . . .	79.2	—	9.2
Region of Middle Volga . . . . .	98.3	—	66.7
Central Chernozym Region. . . . .	79.0	42.0	13.8
Uzbekistan . . . . .	84.0	—	7.1
Turkmanistan . . . . .	60.0	—	7.0
Tadzhikistan . . . . .	33.9	—	—
Kirghizia . . . . .	63.7	29.0	14.4
Kazakstan . . . . .	62.7	...	28.7

Towards the end of the second decade of March the snow-line passed through the southern part of the Ukraine, north of Rostov-on-Don and through the region of the Lower Volga ; by 1 April, as temperature was higher, it had been displaced toward the northern part of the Ukraine and, passing through Kharkov, almost reached Uralsk.

In the third decade of March sowings were already being made in the southern part of Central Asia and in Transcaucasia and toward the end of March and beginning of April in Northern Caucasia and Crimea.

The season is this year very backward and the Government is making every effort to assure timely completion of spring sowings, especially in the districts where, even if the season is normal, the period during which sowings can be effected is relatively brief

Yugoslavia : The weather in March was very cold, especially in the first three weeks. The considerable snowfall remained on the ground until the end of the month despite



the milder weather and rain in the last week. As a consequence, on April 1 the work of preparing the soil for the spring sowings had still not commenced.

*Argentina* : Weather favoured preparatory work. Thanks to the rains in the first half of March, sowings were effected in generally satisfactory conditions and germination was normal in the regions of the North. In the provinces of Buenos Aires and Santa Fé it remained toward the middle of March to sow the areas where the maize crop had been harvested late.

*Canada* : In the following table are given the respective portions of each of certain crops produced in 1931 which are merchantable compared with the corresponding figures for 1930 :

*Production of merchantable quality.*

1931	Total production		Production of merchantable quality		% Merchantable
	ooo centals	ooo bushels	ooo centals	ooo bushels	
Wheat . . . . .	182,486	304,144	180,791	301,318	99.1
Rye . . . . .	2,980	5,322	2,952	5,272	99.1
Barley . . . . .	32,344	67,383	32,008	66,684	99.0
Oats . . . . .	111,615	348,795	108,880	340,249	97.5
1930					
Wheat . . . . .	252,403	420,672	249,822	416,370	99.0
Rye . . . . .	12,330	22,018	12,282	21,931	99.6
Barley . . . . .	64,877	135,160	63,918	133,163	98.5
Oats . . . . .	143,870	449,595	141,525	442,266	98.4

*United States* : The following statement was made by the United States Department of Agriculture of farmers' intentions to plant as on March 1, 1932. This statement is not a forecast of the acreage that will be actually planted ; the latter will depend on weather conditions during the months to elapse before harvest, price changes, labour supply, etc.

*Intended plantings in 1932 in per cent. of the acreage grown for harvest in 1931.*

	Durum	Spring Other	Wheat total	Barley	Oats
% of area grown for harvest in 1931.	134.8	153.3	119.5	121.3	108.4
Area harvested in 1931 (thousand acres).	2,869	11,071	13,940	11,471	39,722

For spring wheat the total area which it is intended to plant in 1932 is 20,835,000 acres ; last year farmers reported intentions to plant about 17 ½ million acres, whereas the area actually harvested was 13,940,000 acres, the large difference being due to the extensive damage caused by drought during 1931. Thus although the area which it is intended to plant this year shows the large increase of 50 % over that harvested last year it is only about 19 % larger than the reported intentions to plant of April 1931. In previous years the acreage of spring wheat harvested has usually, on the contrary,

been slightly in excess of the acreage intended, except in years of exceptional abandonment such as 1931.

As regards winter wheat, the extent of winter damage is still undetermined but the acreage sown last autumn as estimated in December was 38,682,000 acres and assuming average abandonment this would mean 33,820,000 acres to be harvested in 1932. For the 1931 crop the December estimate of area sown was 42,042,000 acres and that actually harvested was 41,009,000 acres). Adding this figure to the intended area of spring wheat, a very preliminary total is obtained of 54,655,000 acres compared with 54,949,000 and 61,138,000 acres harvested in 1931 and 1930 respectively.

According to a telegram of April 9 from the Department of Agriculture at Washington, the preliminary estimate of production of winter wheat based on crop condition on April 1 (75.8 % of the normal compared with 88.8 % on April 1, 1931) and the relation between condition and yield in previous years, is 274,800,000 centals (458,000,000 bushels), compared with 472,479,000 (787,465,000) in 1930-31 and 352,531,000 (587,541,000) on the average for the period 1925-26 to 1929-30 ; percentages : 58.2 and 78.0.

In general, farmers are increasing the acreage of crops needed on their own farms for food and livestock feed. Farmers report intentions to plant an area to oats 8.4 % larger than that harvested in 1931. If the acreage harvested in 1932 falls below intentions to about the same extent as in recent years, the acreage for harvest will be about 42,549,000 or 7 % greater than the 39,722,000 harvested in 1931.

Intentions reported indicate a 21 % increase in the barley acreage. As for most other crops, the largest increases are reported in areas which suffered most from drought last year. The harvested acreage usually falls several per cent. below that intended ; the reports on intentions indicate that the acreage for harvest in 1932 will be about 13,781,000 acres against 11,471,000 harvested in 1931.

According to telegraphic information received from the Department of Agriculture at Washington, in the week ended on March 31 the weather was favourable and field work was in full swing. Serious damage to winter wheat was reported in the western States of Kansas. In the following week the weather was generally very favourable and the crop condition of winter wheat was on the whole fairly good, growth was beginning again in the Ohio valley. Many fields were bare in Western Kansas and considerable damage was caused by soil-blowing in the extreme western part of the State.

Winter oats were badly damaged by early March freezes in Alabama. Spring oat replanting was about finished in some south-central districts while seeding continued in the lower Ohio Valley.

The weather continued to be favourable in the week ended on April 13 and the growth of winter wheat was good, the Ohio Valley crop making a good recovery from the effects of the cold weather in March. Rain was needed in some areas, especially in Nebraska and western Kansas. Spring sowing was begun in many northern sections but the land was still too wet in parts.

In the week ended on April 22 growth was slow owing to the cool weather and rain was needed in the Southwest. Sowing of spring cereals made good progress.

*Mexico* : February was marked by cold, dry weather. The almost complete absence of rain in the principal cereal producing areas gave rise to fears for the crop. During the latter half of February frequent falls of snow and isolated frosts were reported. Crop condition was in general good in the central region and fair in the North.

*India* : Light rains fell in the Punjab in the second week and last ten days of March and the first few days of April, benefiting standing crops. Local damage was caused to standing crops by hailstorms in parts of Lyallpur and Multan and to harvested crops in

parts of Gurgaon and Rohtak by rain, high winds or rats. On April 11 the condition of standing crops was average to good on irrigated areas and below the average to average on unirrigated. In the United Provinces rainfall in the last three weeks of March was mostly only scattered and light. Various districts, chiefly in the southwestern area, reported damage by hail, untimely rain or want of rain. On April 9 standing crops were doing fairly well; prospects for irrigated crops were favourable but for unirrigated were unfavourable.

In the Central Provinces the weather in the last ten days of March and the first few days of April was warm and somewhat cloudy with variable light to moderate rains.

For India as a whole the condition and prospects of crops at the beginning of April was on the whole reported to be fairly good. According to a telegram of April 8 the wheat area in the Punjab for 1931-32 is estimated at 10,887,000 acres or practically the same as in the previous season compared with the average of 10,715,000 or 1925-26 to 1929-30; percentages: 100.0 and 101.6. Production is estimated at 75,130,000 centals (125,216,000 bushels) or 7.6 % smaller than the corresponding figure for 1930-31 (81,267,000 centals; 135,415,000 bushels) but 2.5 % above the average (73,261,000 centals; 122,102,000 bushels).

*Palestine* : Unseasonable weather conditions prevailed throughout the last three weeks of February. The heavy rains of the first week of March proved of material benefit to all crops. This was enhanced in those areas where snow fell and the ground was enabled to absorb a larger proportion of water. The abnormally high temperatures of the latter part of March have promoted rapid growth of crops, but the prevalence of drying winds has withdrawn a considerable amount of moisture from the soil. The need for more rain is apparent almost throughout the country. Failing a further spell of cool wet weather, grain crops will be poor. Crop condition as at 1st of April was very poor. Rainfall is much below the average.

*Algeria* : March was on the whole a favourable month for cereals. Fine weather predominated except for a misty, cold spell towards the middle of the month. The rain, although not very abundant, was fairly regular and well distributed; quantity of rainfall since the beginning of the season however, despite abundant precipitation in February, has been below the average, for example in the centre and especially in the east of the colony; the department of Constantine has been better favoured except in the interior high plateaux.

Growth, which had been checked by cold in the high plateaux, principally in the west, has recovered vigorously; at the end of March, although the appearance of early sowings was good, late ones were rather poor although very regular; the last week of March and the first of April again brought an improvement in the condition of sowings in the interior. On the coast, cereals at the beginning of this month looked well despite some attacks of *ceridomya* and a few cases of lodging in early fields; sirocco winds towards the middle of March caused no appreciable damage. The cereal crop situation was therefore, on the whole, satisfactory.

*French Morocco* : Very heavy rains in February and March have considerably improved the winter cereal crop situation. Yields will, however, be affected rather seriously by the prolonged drought; in South Morocco since the beginning of February a large part of the crop has been lost. Moreover the growth of weeds has been greatly encouraged by the wet weather. Crop condition, although improved, is still not satisfactory.

*Tunisia* : The total area sown to cereals this season will be particularly large, according to information just received; with 3,650,000 acres it exceeds by nearly 12 % that of

last year, which was the largest till then recorded for the Regency, and is more than 17 % larger than the average of the five seasons 1925-29 and almost double the area sown in 1922, the postwar minimum. Barley shows a particularly large extension.

The abundant and regular rains in March were very beneficial. They had an unfavourable effect on locust egg masses; large flights were beaten down in the South.

*New Zealand*: Drought in the Canterbury district, where the bulk of the grain is grown, resulted in poor growth, estimated yields per acre being six bushels below those of last year.

## MAIZE

Information on the course of the season and on the condition of maize crops in Argentina gives rise to the anticipation of poor harvest results. This anticipation is confirmed by the first official estimate according to which production is calculated at 150,246,000 centals (268,296,000 bushels) or 35 % smaller than the record crop of last year and 9 % below the average of the preceding quinquennium.

The data of area, production and exports of Argentina maize over a series of years are given in the following table as a basis of comparison.

ARGENTINA: *Area, production and export of maize.*

YEAR OF HARVEST	AREA			YIELD		PRODUCTION	EXPORT
	sown	destroyed	harvested	per acre		total	(1 May-30 April)
	acres					centals	
				a)	b)		
1932 . . .	14,468,232	...	...	10.4	...	150,245,534	...
1931 . . .	13,776,327	2,461,206	11,315,121	16.8	20.5	231,706,613 (1)	191,130,393
1930 . . .	13,955,234	4,306,339	9,648,895	11.3	16.3	137,146,026	124,056,029
1929 . . .	11,831,579	3,137,568	8,694,011	11.4	15.5	134,638,408	112,152,703
1928 . . .	10,739,357	1,936,529	8,802,828	16.2	19.8	174,496,464	140,421,373
1927 . . .	10,598,505	1,537,883	9,060,622	17.0	19.8	179,677,345	161,433,063
1926 . . .	10,618,274	983,711	9,634,562	17.0	18.7	180,118,271	136,299,244
1925 . . .	9,162,060	1,966,671	7,195,389	11.4	14.5	104,328,272	72,728,230
bushels							
1932 . . .	14,468,232	...	...	18.5	...	268,296,327	...
1931 . . .	13,776,327	2,461,206	11,315,121	30.0	36.6	413,762,935 (1)	341,305,211
1930 . . .	13,955,234	4,306,339	9,648,895	20.1	29.1	280,618,668	221,529,226
1929 . . .	11,831,579	3,137,568	8,694,011	20.3	27.7	240,426,382	200,273,229
1928 . . .	10,739,357	1,936,529	8,802,828	29.0	35.4	311,601,677	250,753,133
1927 . . .	10,598,505	1,537,883	9,060,622	30.3	35.4	320,853,275	283,363,397
1926 . . .	10,618,274	983,711	9,634,562	30.3	33.4	321,640,645	243,392,169
1925 . . .	9,162,060	1,966,671	7,195,389	20.3	25.9	186,300,994	129,872,193

a) Yield in relation to area sown; b) Yield in relation to area harvested.

(1) Ten months 1 May to 28 February.

It may be stated that if, in absolute figures, the production forecast for this year is larger than in 1929 and 1925, this result is due exclusively to the recent extension of the crop. The area sown to maize has, in the current season, reached the maximum recorded in the Argentine statistics, the figure closely approaching 15 million acres. But due to the damage caused by drought and locusts a large proportion of the area sown will bear no crop and the fields harvested also present very low average yields. In relation to the area sown the average yields forecast for this year are the lowest in the period considered.

The estimate of the probable result of the Argentine crop constitutes a factor of fundamental importance in judging the prospects of the world maize market in the near future for the reason that this country furnishes from 2/3 to 3/4 of the total quantity of maize imported by the consuming countries. On the basis of the production indicated by the official forecast and taking into account the probable home consumption of the country (according to the Government's calculations, Argentina last year absorbed 35,495,000 centals (63,383,00 bushels) of maize), the quantity exportable during the commercial season May 1, 1932 to April 31, 1933 will be only a little above 110 millions (197 millions). The total quantity available for export during the twelve months following the harvest of 1932 will consequently almost correspond to that actually exported last year by Argentina in the space of only five months from May to September 1931 leaving on October 1, 1931, an exportable surplus of about 95 millions (169 millions).

*Net imports of maize into the principal importing countries from November to February.*

	1931- 32	1930- 31	1929- 30	1928- 29	1927- 28	1926- 27	1925- 26	1931- 32	1930- 31	1929- 30	1928- 29	1927- 28	1926- 27	1925- 26
	(thousand centals)							(thousand bushels)						
I. Countries producing and importing maize:														
1 Italy . . . .	4,449	4,727	5,249	9,921	3,953	2,352	3,124	7,945	8,441	9,374	17,716	7,050	4,201	5,579
2 France . . . .	8,816	7,387	6,480	7,557	5,066	5,877	5,509	15,748	13,102	11,535	13,496	9,047	10,137	9,838
3 Spain . . . .	2,308	1,283	2,361	2,692	2,509	1,744	3,680	4,122	2,291	4,216	4,807	4,480	3,114	6,571
4 Czechoslovakia	5,362	2,912	1,739	2,132	2,498	2,454	3,435	9,574	5,201	3,106	3,807	4,460	4,382	6,134
5 Portugal . . . .	395	873	340	390	586	454	375	705	1,559	606	697	1,047	811	669
6 Greece . . . .	1,706	29	115	141	132	203	106	3,047	51	205	232	236	382	189
7 Austria . . . .	2,798	1,616	1,605	966	1,263	1,508	1,365	4,996	2,886	2,866	1,724	2,256	2,693	2,437
8 Poland . . . .	51	86	90	137	608	276	64	91	154	161	244	1,087	492	114
9 Switzerland . .	1,453	1,186	1,003	1,195	897	774	1,517	2,594	2,118	1,791	2,134	1,602	1,382	2,709
10 Canada . . . .	2,163	1,709	3,289	2,934	3,062	3,752	2,273	3,862	3,051	5,874	5,240	5,468	6,701	4,059
11 Japan . . . .	(1) 538	388	459	300	220	174	77 (1)	981	693	819	535	394	311	138
Total . . . .	39,039	22,146	22,710	28,365	20,794	19,368	21,535	(2) 53,640	39,547	40,553	50,652	37,136	34,586	38,437
II. Countries only importing maize:														
1 Great Brit. and N. Ireland . . .	26,464	16,678	11,674	13,530	14,140	13,973	16,566	47,258	29,782	20,846	24,160	25,251	24,952	29,581
2 Netherlands . .	16,098	10,485	8,836	8,272	10,781	9,938	8,428	28,747	18,638	14,976	14,771	19,251	17,747	15,051
3 Germany . . . .	4,797	2,403	6,912	4,773	14,145	10,650	2,434	8,567	4,291	12,342	8,523	25,259	19,035	4,346
4 Belgium . . . .	7,253	4,566	4,154	3,086	5,038	5,723	4,411	12,952	8,153	7,417	5,512	8,996	10,220	7,878
5 Denmark . . . .	7,815	2,795	2,094	1,155	5,736	4,147	3,219	13,956	4,992	3,740	2,063	10,244	7,405	5,748
6 Irish Free State	(1) 3,295	2,950	2,202	2,575	2,355	1,938	2,169 (1)	5,890	5,268	3,933	4,598	4,205	3,480	3,874
7 Norway . . . .	1,570	1,016	666	384	1,019	897	617	2,803	1,815	1,189	685	1,819	1,602	1,102
8 Sweden . . . .	(1) 1,931	1,872	888	353	1,526	765	564 (1)	3,449	3,342	1,223	630	2,724	1,366	1,008
Total . . . .	69,226	42,715	36,776	34,128	54,740	48,040	38,408	(3) 123,622	76,276	65,671	60,942	97,749	85,787	68,588
GRAND TOTAL . .	99,265	64,861	59,486	62,493	75,534	67,408	59,933	(4) 177,262	115,823	106,224	111,594	134,885	120,373	107,025

(1) Imports from November to January. — (2) Not including imports of Japan in March. — (3) Not including imports of Irish Free State and Sweden in March. — (4) Not including imports of Japan, Irish Free State and Sweden in March.

It is true that the quantities available in Danubian lands are at present much more important than last year. The crops of Rumania, Yugoslavia and Bulgaria in 1931 attained 238 million centals (425 million bushels) against 194 million (346 million) in 1930, while their total exports have showed up to now only a moderate increase on those of last season. The quantities exportable from these countries in the coming months considerably exceed those of 1931.

This possibility of development in Danubian exports cannot, however, compensate for the heavy decrease expected in the quantities exportable from Argentina in

relation to those of last season. If account is also taken of the fact that the South African crop, owing to drought, is very little above the low level of 1931, there are grounds for believing that the total quantity available throughout the world up to the new crop in the northern hemisphere are less important than last year at this date.

On the other hand, judging by imports during the current commercial season, the capacity of the importing countries for further absorption remains large. The quantities imported from 1 November 1931 to 28 February 1932 by the nineteen countries that are the most important buyers on the world market are the largest recorded in the last seven years and consequently stocks should not be excessive in any of these countries.

These different factors, as well as the relatively high prices of barley and oats, of which 1931 crops were deficitary, lead to the conclusion that, if the results of the Argentine crop confirm the first estimate, an improvement of the maize market may be expected.

\* \* \*

*France* : Preparation of the soil and the sowings have been favoured by particularly good weather conditions; rainfall in the first week of April has made up the deficiency of soil moisture.

*Hungary* : It was not possible to begin maize planting until nearly the end of March.

*Italy* : In March preparations for sowing were effected and the latter took place regularly.

*United States* : According to a report of farmers intentions to plant as on March 1 published by the Department of Agriculture, an increase of 2.2 % over the acreage harvested last year is intended by farmers. This increase, if carried out, would result in 107,278,000 acres; allowing for departures from intentions, the acreage would be 106,486,000 or 1  $\frac{1}{2}$  million acres more than was harvested last year.

In the week ended on March 31 maize planting advanced in more southern districts and extended as far north as Arkansas and eastern Oklahoma.

*Dutch Guiana* : Maize production in the last quarter of 1931 was small. Sowings were restricted by heavy rains and production from standing crops is expected to be inadequate.

*Mexico* : The work of preparing the soil and sowings have generally been effected under good conditions thanks to fine, dry, cold weather in February.

Rain was considered to be indispensable for germination. It is generally expected that the area sown this year will be smaller than that of last year due to low maize prices on the world market.

*Algeria* : Thanks to the favourable conditions of March, preparation of the soil was good and particularly careful. Sowings were almost finished at the beginning of April and were also made under excellent conditions.

*Egypt* : The weather conditions have been favourable. The growth of wheat has improved since last month. Early sown areas in Upper Egypt are maturing and grain

is already forming in Lower Egypt. All areas were given the last watering during the month. As regards barley, harvesting of early sown areas in Upper Egypt has been commenced and everywhere else ripening is almost complete. Yields per acre are expected to be a little above the average.

### Maize.

COUNTRIES	AREA				PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931 — 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 — 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	
	1931/32	1930/31	1925/26 to 1929/30	1930 — Aver. 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 — Aver. 1931 = 100	
	1,000 acres				1,000 centals			1,000 bushels of 56 lbs				
Austria . . .	148	143	146	103.9	101.7	3,314	2,663	2,490	5,917	4,756	124.4	138.1
Bulgaria . . .	1,676	1,689	1,671	99.2	100.3	21,983	17,083	14,713	39,256	30,515	128.6	149.4
Spain . . . .	1,053	1,106	1,057	95.2	99.6	14,778	16,152	13,144	26,389	23,844	91.5	112.4
France . . . .	833	833	848	99.9	98.2	13,246	12,532	9,423	23,654	22,370	105.7	140.6
Greece . . . .	523	546	503	96.7	105.0	3,008	3,809	3,597	5,371	6,802	79.0	93.6
Hungary . . .	2,720	2,605	2,662	104.4	102.2	33,459	31,021	39,546	59,749	55,394	107.9	84.6
Italy . . . (s)	3,423	3,490	3,541	98.1	96.7	41,519	62,832	51,754	74,142	112,200	66.1	80.2
Italy . . . (t)	233	255	218	93.4	100.3	2,266	3,003	2,013	4,046	5,962	75.5	112.6
Poland . . . .	243	233	217	104.2	111.6	2,206	1,847	1,940	4,099	3,269	124.3	113.3
*Portugal . . .	855	868	827	99.6	104.6	...	9,364	7,050	...	16,722	14,196	...
Rumania . . .	11,749	10,939	10,606	107.4	110.8	138,418	99,648	99,979	247,175	177,942	138.9	138.4
Switzerland . .	3	3	3	79.2	76.4	64	64	84	114	114	100.0	75.9
Czechoslov. . .	344	360	343	95.6	100.5	5,020	5,479	5,863	8,965	9,733	91.6	93.6
Yugoslavia . . .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	126,688	136,395	92.6	105.3
Total Europe . .	29,119	28,299	27,390	102.9	106.3	350,314	332,519	311,407	625,565	593,785	105.4	112.5
*U. S. S. R. . .	9,801	9,684	8,386	101.2	116.9	...	...	79,114	...	...	...	...
Canada . . . .	131	161	174	81.2	75.2	3,039	3,263	3,703	5,426	5,826	93.1	82.1
United States . .	104,970	100,743	99,560	104.2	105.4	1,431,843	1,163,704	1,537,197	2,556,863	2,060,185	124.1	93.1
Mexico . . . .	7,939	7,599	7,709	101.5	103.0	42,539	30,353	44,001	75,962	54,201	140.1	96.7
Tot. N. Amer. . .	113,040	108,503	107,443	104.3	105.2	1,477,421	1,187,320	1,584,901	2,633,251	2,120,212	124.4	93.2
China: Man- churia . . . .	2,441	2,139	2,469	114.1	98.9	37,754	35,030	37,848	67,418	62,554	107.8	99.8
Syria and Leb. . .	67	61	121	109.7	55.2	770	600	1,370	1,376	1,071	128.5	56.2
Algeria . . . .	24	24	25	99.2	97.0	133	184	144	238	292	81.3	92.7
Eritrea . . . .	22	22	13	100.0	166.7	132	198	79	236	354	142	166.7
Kenya (1) . . .	196	206	201	94.9	97.6	1,922	3,299	2,475	3,432	5,892	4,420	77.7
Fr. Morocco . .	864	649	561	133.1	154.1	2,982	3,335	2,973	5,326	5,954	89.4	100.3
It. Somaliland . .	28	40	39	70.6	72.9	301	590	426	537	946	760	70.7
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	108	197	236	192	102.5
Total Africa . .	1,178	978	884	120.2	133.6	5,580	7,658	6,205	9,966	13,674	117.80	72.9
Argentina . . .	14,468	13,776	11,549	105.0	125.3	150,246	231,707	165,215	268,296	413,763	295,028	64.8
*Chile . . . . .	89	92	88	96.7	101.0	...	1,516	1,229	...	2,707	2,194	...
Madagascar . .	227	229	207	99.2	110.0	2,025	1,623	2,302	3,322	2,898	4,111	88.1
Un. of S. Afr. . .	5,732	5,370	5,143	106.7	111.3	32,562	32,016	35,776	58,146	57,171	63,885	90.9
Grand Total . .	166,272	159,355	155,211	104.3	107.1	2,056,677	1,828,473	2,145,024	3,672,640	3,265,123	112.5	95.9

\* Countries not included in the totals. — s) Late crop (« maggengo »). — t) Early crop (« cinquantino »). — (1) European crop. — (2) Maize and sorghum.

*French Morocco*: The spring sowings have benefited by very favourable climatic conditions. Their area is apparently above the normal. Sprouting has taken place regularly and rapidly and the young plants are growing vigorously.

*Reunion*: Maize presented a good appearance and gave hope of a good crop.

*Tunis* : Maize and sorghum sowings were effected in the first half of April under good conditions and in well prepared soil, thanks to favourable weather. Rains in March brought beneficial moisture.

*Union of South Africa* : Soaking rains fell in February over the greater part of the Free State and in the Western Transvaal highveld, both particularly important maize areas, as well as in the southeastern portion of the Transvaal. The severe drought in Natal was also definitely broken. Over the greater part of the Transvaal and in the lowveld, however, only fair rains were enjoyed. The Springbok Flats, the most important of the lesser areas of production, have received little relief from the prevailing drought.

## RICE

*Italy* : Preparations for sowing proceeded slowly.

*Ecuador* : According to information published in the national press production of winter rice in 1931 was 692,000 centals (1,538,000 bushels) against 2,002,000 (4,448,000) in 1930. The Government is making active propaganda for the extension of this crop.

*United States* : According to a report of farmers' intentions to plant as on March 1 published by the Department of Agriculture, the intended planted acreage of rice in the United States this year is 11 % less than was harvested in 1931 and, in the southern States, 14 % less. Making allowances for the usual abandonment there will probably be about 760,000 acres for harvest in 1932 in the three southern States compared with 845,000 acres harvested in 1931.

In California growers expect to have sufficient water for irrigation and intend to plant an acreage of 138,000 or 10 % more than the 125,000 harvested in 1931.

In the week ended on March 31 the preparation of rice lands advanced rapidly in Louisiana but rain was needed for seeding and germination.

*Formosa* : Cold weather late in February slightly checked the growth of rice of the first crop in seedling beds, but no great damage is noticeable. Growth on March 1 was normal. Transplanting has been started in the north, while it has been almost finished in the central and southern parts of the island.

*India* : In the period March 8 to April 13 only light scattered rains were registered on a few days in Bengal and on April 13 rain was badly needed for field operations for paddy.

*Indo-China* : The first forecast of paddy production in Cochin-China, made in January, indicated a good crop ; it has subsequently become necessary to lower this first estimate ; last year the preliminary forecast was reduced by nearly 11 million centals (15 million bushels) or over 20 % to give the final figure.

The estimate published in last month's Report, although approximate, therefore remains unchanged, giving the total production of Indo-China at a possible maximum



of 126 million centals (280 million bushels) of paddy subject to the absence of any ultimate large changes in the forecast already published.

*French West Africa* : The 1931 crop in Senegal was only average owing to the premature cessation of the rains.

*Egypt* : The Government has authorised cultivation of sefi (summer) rice on an area of 178,750 acres in various parts of the Delta. This area is in three categories, to be sown by 25 April, 1 May and 10 May respectively. This means a reduction of 37.5 % in sowings of sefi rice with respect to the average of the five seasons ending 1929-30, the last season for which data are at present available. It is known that the area sown last year was also below the average owing to the low level of the river and the lack of water. The sowings of sefi, which account for almost the entire rice crop and furnish the best rice on the market are always dependent on the amount of water available for the season. This year too the reduction in area is due to the lowness of the river and is even greater than was expected last month.

## POTATOES

*Belgium* : Planting of early potatoes has begun and the land is being prepared for the late varieties. An extension in acreage planted is anticipated.

*France* : Preparation of the soil and sowings have been favoured, by particularly good weather conditions ; rainfall in the first week of April has made up the deficiency of soil moisture.

*Great Britain and Northern Ireland* : Preparation of the land is more advanced than usual and, though planting of the main crop had not yet become general by the end of March save in Northern Ireland, where there has been a considerable increase on the 1931 area, that of early varieties was well forward.

*Hungary* : It was not possible to begin potato planting until nearly the end of March.

*Italy* : In the latter half of March planting continued regularly. In Sicily lifting of early varieties was in progress.

*Argentina* : Towards the middle of March potato lifting was still in progress in the province of Buenos Aires. Yields are rather low due to the dry weather of January which caused considerable damage.

*United States* : According to a report of farmers' intentions to plant as on March 1 published by the Department of Agriculture, intentions indicate an increase of nearly 2 % over the area harvested in 1931. If carried out, these intentions would result in an area for harvest in 1932 of about 3,350,000 acres after allowing for average loss due to drought, floods, blight, etc., this being about 1 % less than the 1931 harvested acreage.

*Mexico* : Preparation of the soil and plantings were effected under good conditions, the weather in February being fine, dry and cold. Crop condition is generally satisfactory. Yields of early varieties pulled in February were moderate.

*Palestine* : In Jericho potatoes are being harvested with heavy yields. Sowing is being carried out in the hills. On the coastal plain the crop is developing well.

*Algeria* : Preparation of the soil for spring crops was very good and particularly careful owing the favourable conditions in March, with its predominance of fine weather and sufficiency of soil moisture, maintained by light and well distributed rains.

Plantings, already almost completed at the middle of March, were made in excellent conditions.

The last liftings of early varieties gave good yields so that the crop has been on the whole satisfactory.

## SUGAR

Since the publication of the March Crop Report the most important event which may have an influence on the decisions of the beet producers of some European countries has been the agreement finally concluded between Cuba and Java.

In fact, on March 30, the International Sugar Council made it known that, as a

### *Acreege of Sugar Beet.*

COUNTRIES	1932 (*)	1931	Average 1926 to 1930	% 1932	
				1931 = 100	Average = 100
				%	%
Acres					
Germany. . . . .	700,000	941,357	1,102,067	79	67
Austria . . . . .	107,500	106,000	69,381	101	155
Belgium . . . . .	150,000	140,178	154,685	106	96
Denmark. . . . .	89,000	74,800	90,659	119	98
Spain . . . . .	185,000	250,000	165,519	75	112
Irish Free State . . . . .	13,100	5,012	14,246	258	91
Finland . . . . .	6,200	4,990	5,281	124	117
France. . . . .	620,000	599,500	629,283	103	98
Great Britain. . . . .	280,000	284,174	223,923	119	125
Hungary . . . . .	86,000	138,475	171,953	62	50
Italy. . . . .	170,000	264,000	252,128	65	69
Latvia . . . . .	12,000	11,100	(x) 5,200	111	238
Netherlands. . . . .	111,000	92,609	152,926	120	73
Poland . . . . .	334,000	367,200	516,594	91	65
Rumania . . . . .	20,000	37,000	157,702	67	16
Sweden . . . . .	96,990	87,170	75,428	113	131
Switzerland . . . . .	3,200	3,200	3,573	100	90
Czechoslovakia . . . . .	358,000	453,382	632,745	78	57
Turkey . . . . .	35,062	20,000	20,750	177	169
Yugoslavia . . . . .	90,740	91,200	119,440	100	76
Total Europe a). . . . .	3,467,792	3,926,147	4,563,483	90	77
U. S. S. R. . . . .	4,127,000	3,693,800	1,869,132	112	221
Total Europe b). . . . .	7,594,792	7,619,947	6,432,165	100	119
Canada . . . . .	...	51,000	47,670	...	...
United States. . . . .	...	720,000	710,218	...	...

(\*) Approximate data

(1) Average 1929 and 1930. — a) Not including U. S. S. R. — b) Including U. S. S.

result of the numerous conferences held since the beginning of the year, it had been agreed to fix the Cuban production for 1932 at about 2,700,000 long tons. Moreover, the European countries and Peru, which signed the international agreement, have decided to reduce their export quotas fixed under the agreement for the season ending on September 1, 1932 and for the season ending on September 1, 1933 (for Peru December 31, 1932 and 1933 respectively) by the amount by which the exports of Java from April 1, 1932 to March 31, 1933 exceed 1 ½ million tons.

The countries adhering to the international agreement will make corresponding reductions in the areas to be planted in the current season.

Taking account of these new agreements and the replies received by the Institute in answer to an inquiry made of all the European countries producing beet-sugar, a table has been prepared containing the first estimates of areas to be sown to sugar-beet. The data given in the table have either been transmitted directly in numerical form by the governments or associations of sugar manufacturers or calculated on the basis of information furnished by these governments or associations.

The estimates of the areas that will probably be sown to sugar beet are evidently largely approximate and will be subject to perhaps considerable modifications especially as the international agreements have been concluded too short a time ago for it to be possible to know roughly their effects on the acreages sown.

One of the most important sugar producers, Germany, has not communicated a numerical estimate but has reported a reduction without indicating its extent. According to private information received from reliable sources there is estimated to be a reduction of about 20 % compared with last year but this figure is still very uncertain, especially as sowing will not begin until towards the latter half of April.

In general, there are reported reductions compared with last year in the principal beet-producing countries, the reasons being now well known ; but for France and to a greater extent for Great Britain increases are, on the contrary, reported.

As regards France, an increase in the area to be sown to sugar-beet may be anticipated for the reason already set out in the preceding Crop Report, namely, increased demand for beet this year by the sugar factories. In Great Britain a larger increase is forecast but it should not be forgotten that last year's acreage was 33 % smaller than that of 1930.

No figure for Bulgaria is given in the table because at present not even the roughest approximate data for this country are known.

If the U. S. S. R. is not taken into account, on the basis of these first forecasts there may be calculated for Europe a reduction of 10 % in the beet acreage compared with 1931 and of 23 % compared with the average.

If the U. S. S. R. succeeds in making an increase of 12 % on last year, as was proposed in the Five year Plan, the total beet area in 1932 for Europe including the U.S.S.R. will be practically the same as in 1931 and 19 % above the average of the preceding quinquennium.

The Government of Korea has just telegraphed to the Institute that in 1932 no sugar-beet will be grown.

\* \* \*

*Belgium* : The land is being prepared for the planting of sugar-beet.

*France* : Preparation of the soil and the sowings have been favoured by particularly good weather conditions ; rainfall in the first week of April has made up the deficiency of soil moisture.

*Great Britain and Northern Ireland* : The preparation of the land is more advanced than usual, thanks to the fine dry weather in March.

*Italy* : In the latter half of March sowings began.

*Guadeloupe* : Poor rum sales have led a certain number of distilleries to suspend cane deliveries. Moreover, the planters, hoping for a rise in prices, have not cut their cane which has been dried up by the supervening drought. It seems, therefore, that sugar and rum production will not be so abundant as the year's very good crop gave reason to believe.

*Mexico* : Cutting has been effected under good conditions and the yields obtained in the principal producing areas are generally satisfactory. Due to the reduction in area, however, this year's crop will be smaller than that of last season.

*Production of Cane Sugar.*

COUNTRIES	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	Percentages for 1931-32	
							1930-31 = 100	Average = 100
Thousand centals			Short tons			%		
AMERICA.								
Argentina . . . . .	7,622	8,412	8,311	381,124	420,595	440,541	91	86
Brazil . . . . .	21,605	20,159	19,385	1,080,000	1,007,900	969,247	107	111
Cuba . . . . .	60,480	69,933	104,428	3,024,000	3,496,600	5,221,343	86	58
Ecuador . . . . .	423	425	432	21,160	21,800	21,577	99	98
United States . . . . .	3,120	3,674	1,911	156,000	183,693	95,575	85	163
Guadeloupe . . . . .	816	375	542	41,000	19,000	27,100	218	150
British Guayana . . . . .	2,826	2,862	2,570	141,280	143,096	123,504	99	110
Jamaica . . . . .	1,323	1,279	1,329	66,000	64,000	66,438	103	99
Mexico . . . . .	5,200	5,247	4,242	265,000	262,000	212,109	101	125
Peru . . . . .	10,196	9,480	8,009	509,800	470,000	400,468	108	127
Porto Rico . . . . .	18,977	15,673	13,716	948,900	783,664	685,809	121	138
Dominican Republic . . . . .	8,497	8,125	7,707	424,850	406,237	385,339	105	110
El Salvador . . . . .	666	1,024	507	33,289	51,210	25,353	65	131
Total, America . . . . .	141,841	146,668	173,589	7,052,000	7,325,800	8,079,393	97	82
ASIA.								
Formosa . . . . .	20,463	17,577	13,620	1,023,155	878,841	681,427	116	150
India . . . . .	86,912	72,083	66,618	4,346,000	3,694,000	3,380,880	121	130
Japan . . . . .	2,072	1,714	1,821	103,586	85,676	91,040	121	114
Java . . . . .	54,013	62,663	57,172	2,700,000	3,133,116	2,858,554	86	94
Philippine Is. . . . .	18,960	18,796	16,404	950,000	939,771	820,180	101	116
Total, Asia . . . . .	182,420	172,833	155,644	9,123,000	8,641,404	7,782,081	106	117
AFRICA.								
Egypt . . . . .	3,197	2,685	2,094	159,800	134,300	104,691	119	153
Mauritius . . . . .	3,858	4,871	5,041	193,000	243,560	252,045	79	77
Mozambique . . . . .	3,417	1,907	1,622	171,000	95,300	81,076	179	211
Reunion . . . . .	946	1,111	1,116	47,312	55,567	55,775	85	85
Union of S. Africa . . . . .	6,518	7,880	5,297	325,900	393,000	264,868	83	123
Total, Africa . . . . .	17,936	18,434	13,170	897,000	921,727	758,455	97	113
OCEANIA.								
Australia . . . . .	13,149	11,927	11,283	657,000	596,374	564,162	110	116
Hawaii . . . . .	19,120	19,160	17,340	956,000	958,000	867,007	100	110
Fiji Is. . . . .	1,819	2,019	2,002	90,900	101,000	100,083	90	91
Japanese mandated territ. . . . .	964	850	279	43,175	42,513	13,950	113	345
Total, Oceania . . . . .	35,032	33,956	30,904	1,752,000	1,697,887	1,545,202	103	113
General Totals . . . . .	377,249	371,891	375,307	18,864,000	18,590,818	18,765,131	101	101

(1) Approximate data.

*Formosa* : Damage by frost was noticed on March 1 in the central and southern parts of the island and the crop prospects of the cane being cut were bad in some districts. In general, a slight outbreak of noxious insects and moulds was reported, and the prospects of the crop were normal.

The cane just planted which had been affected by frost was recovering gradually, and growth was on the whole normal.

*India* : Sugar-cane in Bihar and Orissa was in good condition at the beginning of April.

*Egypt* : Tillage and sowing are in full swing. In Assuan province sowing is over. Germination and growth are satisfactory. Cutting of last year's crop is almost over.

Crop condition of sugar cane on April 1 was 104 against 103 on March 1, 1932 and 102 on April 1, 1931.

*Réunion* : At the beginning of February it was estimated that the mills had crushed 9,894,000 centals (494,700 short tons) of cane, 91.3 % of the quantity crushed last season — 10,833,000 (541,700) and 84.2 % of the average for the five seasons ending 1929-30 — 11,755,000 (587,700). Rendement has been average, varying generally between 9 and 11 tons of sugar per 100 tons of cane, with a minimum of 7 and a maximum of 11.5 tons.

*Union of South Africa* : Heavy rains fell on the North Coast of Natal and Zululand during the latter half of February and good rains were also enjoyed along the South Coast. Weather has generally been good for sugar-cane.

*New Caledonia* : On February 24 a violent cyclone caused important damage, the extent of which has not yet been determined.

## VINES

*Austria* : The vines are healthy and have grown strongly. Pruning had to be interrupted several times and could be finished only in a few vineyards. Weeding has begun in a few vineyards.

*France* : The period from 15 March to 15 April was rainy throughout the area with very great differences, however, as regards amount and date of precipitation. In the South rain fell from the third week of March, interrupting to some extent work in the vineyards but bringing beneficial humidity; in the other regions, in the south-west, centre and east, the rains at the end of March and beginning of April, ending the long period of winter drought, restored a situation that was beginning to be disquieting.

The prolonged cold delayed vegetation; at the end of March leafing had scarcely begun on the earliest and best exposed stocks in the southern vineyards. The delay has so far prevented the vines suffering from frosts, of which there was one particularly severe in the last days of March and from the hailstorms that have occurred in places. Good progress of vegetation depends, however, on a warm sunny period.

Work has been carried out under very good conditions, though it has been slow, owing to the delay in pruning for the purpose of avoiding rapid growth and owing to the hoar-frosts in March and April, the effects of which are particularly to be feared this year. Grafting is done in April.

Markets remain quiet and prices are stationary. Stocks leaving holdings remain inferior by over 55 million Imperial gallons (66 million American gallons) to those of a normal year, while taxable consumption remains good.

*Italy* : In March pruning ended and tying of the shoots began. Anticryptogamic treatment was carried out regularly.

*Portugal* : Hoeing of the roots is completed and the vines are showing satisfactory growth

*Algeria* : Leafing has been slow this year ; while the early stocks developed their first leaves after 15 March on the coast, later varieties were hindered by the fall in temperature and the poorer insolation in the second decade of the month. On the other hand leafing has been free and regular and quite satisfactory.

Anti-cryptogamic treatment, rendered necessary by the humidity of the atmosphere that has been maintained by the light rains well-distributed throughout March and by the mists, was begun in the first days of the month and became general in the first week of April.

Second cultivations and loosening of the surface soil were carried on until the end of March, thanks to the favourable weather. The amount of precipitation since the beginning of the agricultural year is considerably below the average, save in some parts of the Constantine area ; it has been especially small in Oran and in the lower Cheliff, that is, in the most important vine areas.

*French Morocco* : The prolonged drought, cold and rain of February and March were unfavourable to the development of the vines ; leafing was slow and had scarcely begun before the last week of March. Heavy rains have put the soil in good moisture condition but it is feared that they will favour an early attack of cryptogams, which have appeared with the leaves and may cause heavy losses to the vines.

*Tunisia* : Leafing has been slow this year. Crop condition is very satisfactory. Business is quiet. The annual quota of imports into France was almost covered by the end of February.

*Union of South Africa* : Unusual weather prevailed during February ; it is feared that the rains in the Western Province have spoilt the grape crop. The sultana crop along the Orange River also suffered from too much rain.

*Australia* : The rains that fell in February were very beneficial for vines, which were in bad condition owing to the continued drought. However, as the loss by thrips was also fairly serious, it is not expected that a normal quantity of wine will be made this vintage, though it is thought that the quality will be excellent.

## OLIVES

*Algeria* : Pruning and cleaning of olive trees was completed early in April; the latter operation has this year been general.

The precipitation since the beginning of the year has been considerably below the normal, especially in Oran and everywhere save on the plateau of Constantine.

## COTTON

*United States* : In the week ended on March 31 cotton planting had begun actively in southern Georgia and was making steady progress in the West Gulf area.

According to a telegram dated April 13 received from the Department of Agriculture at Washington cotton planting was progressing favourably.

In the week ended on April 22 cotton planting progressed slowly.

*Mexico* : Preparation of the soil and sowings were generally effected under good conditions but owing to the almost complete absence of rains the area under cotton this year will be very much inferior to that of last year. In some areas there has been a 70 % reduction. In general crop condition is satisfactory.

*Paraguay* : Harvesting is in progress and prospects are satisfactory thanks to favourable weather conditions.

*India* : According to a telegram of April 12, the latest estimate of the cotton area in the Madras Presidency is 2,255,000 acres compared with 2,117,000 in 1930-31 and 2,435,000 on the average for the period 1925-26 to 1929-30; percentages: 106.5 and 92.6. Production is placed at 1,712,000 centals (358,000 bales) or 2.7 % larger than the corresponding estimate for 1930-31 (1,667,000 centals; 349,000 bales) but 11.6 % below the average (1,938,000 centals; 405,000 bales). The seasonal factor for April was reported to be 88 as compared with 94 for April, 1931.

*Egypt* : Cotton ginned from 1 September to end of March, in centals and in bales of 478 lbs. net weight, was as follows :

		1931-32	1930-31	1929-30	1928-29
Sakellaridis . . . . .	(centals)	1,132,320	1,558,090	2,330,480	2,249,210
	(bales)	236,890	325,960	487,550	470,550
Other varieties . . . . .	(centals)	4,525,330	4,619,370	5,088,040	4,947,160
	(bales)	946,720	966,400	1,064,440	1,034,970
<i>Total lint.</i> . . . .	(centals)	5,657,650	6,177,460	7,418,520	7,196,380
	(bales)	1,183,610	1,292,360	1,551,990	1,505,520
Scarto (linters) . . . . .	(centals)	151,660	149,190	174,940	208,080
	(bales)	31,730	31,210	36,600	43,530

The corresponding figures as at the end of February 1932 were respectively as follows: 1,033,400 centals (216,190 bales); 4,241,900 (887,430); 5,275,300 (1,103,620); 140,480 (29,390).

Weather conditions in March were somewhat favourable for sowing, germination and growth. Irrigation water was sufficient. Tillage and sowing have made progress; the latter however, in Lower Egypt, is a week late compared with last year as a result of difficulties encountered at the outset. In Middle Egypt, the area sown is about the same as last year at the same date; but in Upper Egypt it is expected that sowing will be ten days earlier than last year. Germination is satisfactory. Re-sowing has been started in the south of the Delta and Upper Egypt; it has not exceeded 4 % so far but is expected to be higher in the areas sown during the second week of March where germination has made slow progress owing to changeable weather.

*Anglo-Egyptian Sudan*: The last cotton report of the Khartum Government indicates. That the amount of cotton picked up to the end of February 1932 was 517,700 centals (108,300 bales) of lint against 217,400 (45,500) up to the end of January. The large increase is due almost entirely to Sakellaridis in the Gezira. It must also be noted that the final figure for production in 1930-31 is 509,000 centals (106,500 bales) and that the total expected for the current season is almost 65 % above the production of the preceding season. The quantity picked at the end of February 1931 was 287,800 centals (60,200 bales) against 316,800 (66,300) in 1930, 397,000 (83,100) in 1929 and 277,000 (58,000) in 1928.

## FLAX

*Belgium*: Sowings have begun. A very considerable decrease is expected.

*France*: A reduction in area sown appears to be almost certain; it is forecast in the northern flax centres.

*Hungary*: Work preparatory to flax planting could not be commenced until nearly the end of March.

*United States*: According to a report of farmers' intentions to plant as on March 1 published by the United States Department of Agriculture, it is intended to plant 2,689,000 acres, which is 16.3 % larger than the harvested acreage of 1931 but 27 % less than the area sown in that year, in which abandonment was as high as 37 % of the acreage sown. Allowing for departures from intentions the area for harvest would be 2,660,000 acres.

*India*: Light rains fell in some districts of Bihar and Orissa in the last three weeks of March and the beginning of April; at the beginning of April crop condition was good. In the United Provinces, rainfall in the last three weeks of March was mostly only scat-



tered and light. Unfavourable weather caused local damage in the southwestern area. On April 2 standing crops were doing fairly well; prospects for irrigated crops were favourable but for unirrigated were poor. The second estimate of the flax area for India in 1931-32 is 2,580,000 acres against 2,299,000 in the previous season and 2,673,000 on the average for 1925-26 to 1929-30; percentages: 112.2 and 96.5.

*Palestine* : Good prospects of a fair yield. Early sown crops are in flower in Northern Palestine. Crop condition as at 1 April was poor.

## HEMP

*Hungary* : It was not possible to begin hemp planting until the last few days of March.

*Italy* : In the second half of March sowings were begun regularly.

## TOBACCO

*Hungary* : In some districts the preparation of beds for tobacco seeding is still in progress. Seeds put in the beds early have begun to germinate.

*Italy* : The plants are beginning to sprout and crop condition is normal.

*United States* : According to a report of farmers' intentions to plant as on March 1 published by the Department of Agriculture drastic curtailment in the intended acreage of tobacco is shown for all types except Maryland and Pennsylvania for which there are indicated slight increases. The total area intended to be planted this year is 1,562,200 acres, a decrease of 22.6 % from that harvested in 1931. The indicated acreage for harvest in 1932 is the smallest since 1921. Decreases in acreage for the main varieties are reported as follows: — flue-cured 27 %; fire-cured 28 %; burley 14 %; other air-cured types 39 %; cigar filler 3 %; cigar binder 17 % and cigar wrapper 18 %.

*Algeria* : Preparation of the soil for tobacco planting has been thoroughly done, favoured by the conditions in March; the land is mellow and has sufficient moisture

The first plantings on light and favourably situated lands have been in progress since March 20; transplanting began at the end of the month and was general in the first half of April.

## OTHER PRODUCTS

## Cacao.

*Gold Coast* : In February marketing of the major crop was practically completed. In Ashanti the crop has been about normal and in the Colony proper below normal. The general shortage of money resulted in the picking of practically every available pod. With the completion of the crop in other districts of the Eastern Province there was an influx of buyers into the Krobo area and competition became very keen. At the end of February only 10 % of the crop remained in the hands of the farmers. Movement toward the ports has been rapid ; shipments from the ports in February were the largest recorded, except for last year, when abnormal movement followed the hold-up that occurred earlier in the season.

	February 1932	October 1931 to February 1932	February 1931	October 1930 to February 1931
Arrivals by rail at Takoradi and Accra (1000 lb.). . . . .	39,066	237,073	71,375	205,694
Shipments from Takoradi and Accra (1000 lb.). . . . .	75,855	259,597	71,714	200,150
Shipments from all ports (1000 lb.)	90,615	320 668	93,448	241,026
Stocks at Takoradi and Accra beach at end of February (1000 lb.) . . . . .	28,594	—	...	—

Flowering of the minor crop was general by the end of February. A late and small crop is indicated.

## Tea.

*India* : According to a report of March 31 received from the Department of Commercial Intelligence and Statistics, in North India seasonable weather had prevailed generally but, with the possible exception of Assam, droughty conditions were experienced especially at the end of February ; no crop was harvested in February. In South India the weather had turned warmer with some showers and crop prospects had improved ; the outturn during the month was about on a par with that for the corresponding month of the preceding year.

## Coffee.

*Dutch Guiana* : Coffee production in 1931 was smaller than in 1930 but a good crop is anticipated for 1932 because in the fourth quarter of last year flowering was satisfactory and the trees were in good condition.

*Mexico* : Crops have been generally poor and the yields obtained in the principal producing areas are much below those of last year.

### **Groundnuts.**

*Argentina* : Harvesting was in progress towards the middle of March in the principal producing areas.

Yields are generally considered to be satisfactory.

*United States* : According to a report of farmers' intentions to plant as on March 1 published by the Department of Agriculture, increases in the intended acreage are shown for most States, with heavy increases again planned by growers of the Spanish and runner types in the Southeast and Southwest. If the acreage finally planted this year should bear the usual relation to the acreage intended, the acreage planted in 1932 would be about 7 % greater than that of 1931.

*French West Africa* : Owing to the complete and premature cessation of rainfall during last October, groundnut production in Senegal has been poor ; quality and yield, on the contrary, are good.

### **Colza, mustard and sesamum.**

*Austria* : Winter colza is very late and almost without leaves.

*Poland* : On 15 March crop condition of winter colza according to the system of the country was 2.8 against 3.3 at the same date in 1931.

*India* : At the beginning of April crop condition in Bihar and Orissa was good. In Bengal reaping of spring crops had been almost completed by April 6 ; condition of standing crops was fair. Hail and rats caused local damage in a few districts of the Punjab. On April 4 condition of standing crops was average to good on irrigated areas and below the average to average on those unirrigated. For India the March estimate of area the colza and mustard area was 3,242,000 acres compared with 3,362,000 in 1930-31 and 3,264,000, the average for the period 1925-26 to 1929-30 ; percentages : 96.4 and 99.3.

### **Jute.**

*India* : In the period March 8 to April 6 only light scattered rains were registered on a few days and on April 6 rain was badly needed for field operations for jute.

## SUPPLEMENTARY FIGURES

As the production and area for most countries were published in the February number of the Monthly Crop Report and Agricultural Statistics, it is not necessary to repeat them again this month. Hence only the new data and any modifications of the figures published last month are given in continuation. In another table is shown the total world production based on the figures received up to the time of going to press.

COUNTRIES	(†) AREA					(†) PRODUCTION									
	1931	1930	Average 1925 to 1929	% 1931 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32			
	—	—	—	—	—	—	—	—	—	—	—	—	—		
	1931/32	1930/31	1925/26 to 1929/30	1930 1930/1931	Aver. = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 1930/1931	Aver. = 100		
	1,000 acres					1,000 centals			thous. bush. (60 pounds)						
WHEAT.															
Mexico . . . . .	1,501	1,216	1,261	123.4	119.0	9,736	6,868	6,456	16,226	11,446	10,760	141.8	150.8		
Tunis . . . . .	1,977	1,908	1,719	103.9	115.0	8,378	6,239	7,068	13,962	10,398	11,780	134.3	118.5		
Un. of Sout. Africa	1,723	1,137	878	151.6	196.2	8,473	5,578	4,866	14,122	9,297	8,109	151.9	174.1		
BARLEY.															
Tunis . . . . .	1,223	1,202	1,243	101.7	98.4	3,968	2,646	4,195	8,268	5,512	8,741	150.0	94.6		
OATS.															
Tunis . . . . .	72	124	104	57.7	68.6	728	661	825	2,274	2,067	2,577	110.0	88.2		
RICE.															
Formose . . . . .	888	858	797	103.5	111.5	15,864	15,500	13,971	34,141	34,444	31,046	99.1	110.0		
Indochine:															
Annam . . . . .	1,236	1,601	1,438	77.2	85.9	14,063	11,925	12,940	31,251	26,499	28,756	117.9	108.7		
Cochinchine . . . . .	4,930	5,460	5,033	90.3	98.0	48,636	40,874	48,398	108,079	90,829	107,549	119.0	100.5		
Syam (1) . . . . .	(2) 3,677	(2) 4,034	(2) 3,543	91.1	103.8	51,201	58,018	54,454	113,778	128,925	121,007	88.3	94.0		
Surinam . . . . .	—	—	—	—	—	571	451	400	1,269	1,004	888	126.4	142.9		
SUGAR-BEET.															
Great Britain . . .	234	349	165	67.1	141.6	37,209	68,574	28,747	1,860	3,429	1,437	54.3	129.4		
COTTON (GINNED).															
Anglo-Egypt. Sudan	338	387	274	86.7	122.5	844	509	602	176	106	126	165.8	140.1		
Un. of South Africa	14	31	62	45.3	22.9	—	32	43	—	7	9	—	—		
VINES (WINE).															
Tunis . . . . .	98	98	74	113.1	133.5	15,398	21,997	18,898	18,492	26,417	22,694	70.0	81.5		
OLIVE.															
(*) = olive, † = oil.															
Italy . . . . .	1,499	1,503	1,425	99.8	105.2	29,961	17,461	27,658	2,998,074	1,748,056	2,765,771	171.7	108.4		
— (a) . . . . .	4,095	4,093	4,201	100.0	97.5	4,327	2,755	4,301	63,431	36,201	56,515	175.2	112.		
— (b) . . . . .	—	—	—	—	—	8,945	2,205	4,409	604,458	220,463	440,926	315.0	157.5		
FLAX (FIBRE)															
Hungary . . . . .	44	36	7	122.3	601.1	133	156	46	13,264	15,644	4,648	84.8	285.4		
HEMP (FIBRE)															
Hungary . . . . .	15	24	24	65.2	64.4	111	158	188	11,144	15,764	18,779	70.7	59.3		
SILK.															
Cyprus . . . . .	—	—	—	—	—	(3) 408	(3) 523	(3) 543	(3) 40,392	(3) 52,311	(3) 54,305	77.1	74.8		
SESAMUM															
India . . . . .	5,491	5,618	5,293	97.7	103.7	10,416	11,782	10,416	521	589	521	88.4	100.0		

a) Single crops. — b) Mixed crops. (1) 7 interiors provinces. — (2) Area to be harvested. — (3) Cocoons.

## TOTALS OF WORLD AGRICULTURAL PRODUCTION

The following totals have been obtained from the data in the tables published for each product in January, which have been revised and completed. With the name of each product is indicated the number of countries for which data for 1931 are at present available and also the percentage of their total production in 1930 to world production in the same year as published in the 1930-31 Yearbook, when they comprised nearly all producing countries.

Crop, number of countries comprised in the total, and percentages of world production	AREA					PRODUCTION								
	1931		Average 1925 to 1929	Percentages for 1931 and 1931-32		BRITISH WEIGHTS <sup>a</sup>			AMERICAN WEIGHTS			Percentages for 1931 and 1931-32		
	and	and	and	1930 and 1930-1931	Average	1931	1930	Average	1931	1930	Average	1930 and 1930-1931	Average	
	1931-32	1930-31	1925-26 to 1929-30	1931 = 100	1931 = 100	and	and	1925 to 1929 and 1925-26 to 1929-30	and	and	1925 to 1929 and 1925-26 to 1929-30	1931 = 100	1931 = 100	
	thousand acres			%	%	thousand centials			1931-32	1930-31	to 1929-30	%	%	
Wheat (49 countr. 100.0 %) . . . a)	248,472	253,410	237,136	96.1	102.7	2,218,369	2,253,198	2,146,478	3,688,875	3,755,255	3,577,393	98.2	103.1	
Rye (30 countries 100.0 %) . . . a)	46,281	49,049	47,396	94.4	97.6	480,880	557,835	525,771	thousand bushels (56 pounds)	823,002	906,137	933,530	82.6	87.7
Barley (42 countr. 90.0 %) . . . a)	59,351	62,460	57,057	95.0	104.0	589,042	693,621	641,871	thousand bushels (48 pounds)	1,227,192	1,445,069	1,337,258	84.9	91.8
Oats (37 countries 96.0 %) . . . a)	101,075	103,057	104,517	98.1	96.7	1,050,001	1,126,685	1,170,105	thousand bushels (32 pounds)	3,281,231	3,520,806	3,666,558	93.2	89.7
Maize (26 countries 84.0 %) . . . a)	166,272	159,355	155,211	104.3	107.1	2,056,677	1,825,473	2,145,024	thousand bushels (56 pounds)	3,072,640	3,265,128	3,830,411	112.5	95.9
Rice (rough) (16 countr. 93.0 %) a)	124,600	125,045	120,940	99.6	103.0	1,787,249	1,835,011	1,719,497	thousand bushels (45 pounds)	3,971,571	4,077,720	3,921,028	97.4	103.9
Potatoes (32 countr. 96.0 %) . . . a)	30,276	29,520	29,515	102.6	102.6	3,225,790	3,248,485	2,975,717	thousand bushels (60 pounds)	5,376,210	5,414,038	4,950,429	96.3	108.4
Sugar- (18 countr. a)	4,520	5,315	5,145	85.0	87.8	1,021,035	1,340,659	1,067,691	thousand short tons	51,051	67,482	53,384	75.7	95.6
beet (19 countries 97.0 %) b)	7,853	7,848	6,771	100.1	116.0	1,329,683	1,684,093	1,253,958	thousand bales (478 pounds net)	66,483	84,203	62,697	79.0	106.0
Cotton ginned (15 countr. 93.0 %) . b)	72,704	78,151	78,415	98.0	92.7	114,705	109,127	114,301	thousand bushels (56 pounds)	23,997	22,530	23,912	105.1	100.4
Linseed (18 countr. 99.0 %) . . . a)	15,901	15,083	14,932	90.5	106.1	70,378	60,408	69,745	thousand bushels (56 pounds)	125,676	123,944	124,188	101.4	101.2
Flax (fibre) (13 countr. 76.0 %) a)	692	914	959	75.7	72.2	2,220	3,318	4,006	thousand pounds	222,006	331,797	400,620	66.9	54.2
Hemp (fibre) (3 countr. 60.0 %) . a)	297	356	388	83.3	76.4	1,936	2,901	3,179	thousand pounds	193,567	290,129	317,908	66.7	60.9
Hemp seed (7 countr. 72.0 %) . .	292	351	381	83.1	76.6	714	794	862	thousand pounds	71,430	79,867	84,201	90.0	82.9
Tobacco (10 countr. 65.0 %) . a)	2,560	2,691	2,335	95.1	109.6	20,968	21,667	18,932	thousand pounds	2,098,808	2,166,710	1,866,210	96.9	112.5
Hops (8 c. 94.0 %) .	111	126	146	83.2	76.3	923	1,221	1,270	thousand pounds	92,815	122,137	126,987	76.0	73.1
Olive oil (6 countr. 96.0 %) . . . .	—	—	—	—	—	18,160	8,640	17,592	thousand American gallons	238,626	112,534	231,210	219.2	108.2
Vines (15 c. 83.0 %) .	—	—	—	—	—	(1)3,178,448 (2)2,894,019 (3)3,170,683	(1)3,817,030 (2)3,469,362 (3)3,907,706	(1)3,817,030 (2)3,469,362 (3)3,907,706	thousand pounds	(1)3,817,030 (2)3,469,362 (3)3,907,706	(1)3,817,030 (2)3,469,362 (3)3,907,706	112.2	108.2	
Silk (5 c. 97.0 %) . .	a) 7,699	a) 7,453	a) 7,411	90.8	91.3	(3) 830,404 (3)1,037,367 (3) 898,318	(3) 830,404 (3)1,037,367 (3) 898,318	(3) 830,404 (3)1,037,367 (3) 898,318	thousand pounds	(3) 830,404 (3)1,037,367 (3) 898,318	(3) 830,404 (3)1,037,367 (3) 898,318	84.6	91.3	

a) Not including the U. S. S. R. — b) Including the U. S. S. R. — (1) Wine. — (2) Eggs in incubation. — (3) Coconuts.

## FODDER CROPS

*Germany* : The growth of meadows and pastures is still backward due to the cold.

*Austria* : Clover crops have suffered considerably from recurrent frosts. Mixed clover has so far resisted better. Mixed fodder and vetches are also thin. The meadows and pastures are still covered with snow and in low regions where the snow has disappeared growth has not yet re-commenced. Winter supplies are almost exhausted and the fodder shortage is becoming severely felt everywhere.

*Belgium* : Pastures and clover suffered greatly in March from the severe cold.

The data of production of fodder crops in 1931 compared with the figures for 1930 and the average for the preceding five years are as follows :

Crop		1931	1930	Average 1925-29	% 1930 = 100	% 1931 Av. = 100
(thousands)						
Mangolds	(centals) . . .	117,455	137,024	102,460	85.7	114.6
	(sh. tons) . . .	5,873	6,851	5,123		
Carrots, main crop	(centals) . . .	968	638	623	151.7	155.5
	(sh. tons) . . .	48	32	31		
Turnips and swedes, main crop	(centals) . . .	4,424	4,226	4,836	104.7	91.5
	(sh. tons) . . .	221	211	242		
Crimson clover	(centals) . . .	5,520	5,154	4,688	107.1	117.8
	(sh. tons) . . .	276	258	234		
Red clover	(centals) . . .	9,640	9,724	8,725	99.1	110.5
	(sh. tons) . . .	482	486	436		
Other clover	(centals) . . .	1,960	1,991	1,963	98.4	99.8
	(sh. tons) . . .	98	100	98		
Alfalfa	(centals) . . .	1,455	1,487	1,340	97.9	108.5
	(sh. tons) . . .	73	74	67		
Sainfoin-esparcet	(centals) . . .	427	523	523	81.7	81.7
	(sh. tons) . . .	21	26	26		
Meadow-hay, mown	(centals) . . .	25,276	26,287	22,244	96.2	113.6
	(sh. tons) . . .	1,264	1,314	1,112		

Crop	1931	1930	Average 1925-29	% 1931 1930 = 100	Av. = 100
		(thousands)			
Rye-grass and timothy (centals) . . .	877	915	855	95.9	102.7
(sh. tons). . .	44	46	43		
Turnips (catch crop) (centals). . .	65,056	73,173	61,597	88.9	105.6
(sh. tons). . .	3,253	3,659	3,080		
Carrots " " (centals) . . .	1,797	1,697	1,984	105.9	90.6
(sh. tons). . .	90	85	99		
Spurry " " (centals) . . .	3,809	3,408	4,149	111.8	91.8
(sh. tons). . .	190	170	207		

*Irish Free State* : The weather during March was the driest experienced during that month for many years. The days were harsh and cold and the nights frosty so that there was very little growth. Pastures became bare.

*France* : The condition of meadows and pastures has been greatly improved by rainfall in the first week of April. It appears, however, that fodder production this year cannot but be deficient.

Sowing of spring fodder crops has been effected under good conditions, thanks to timely rains, despite delay incurred owing to bad weather. On April 10 warmer weather was needed to promote growth.

*Great Britain and Northern Ireland* : During the greater part of March the weather was fine and dry. The general lack of moisture somewhat retarded the germination of spring-sown crops on drier lands and the rain that fell in the latter part of the month was welcome, especially for pastures. Seeds were generally looking well at the beginning of April, though there were reports of progress being retarded by cold east winds and occasional frosts.

*Hungary* : Clover and alfalfa have generally wintered badly due to the lack of a protective snow cover. The meadows have not yet recovered in growth and in numerous districts are flooded.

*Italy* : Vegetation of fodder crops is very late and the scarcity of fodder is increasingly felt. Cutting of fodder crops in the irrigated lands (*marcite*), where growth was very backward, is giving exceptionally poor results. Preparation of new meadows is in progress.

*Poland* : On March 15 the crop condition of clover by the Polish system, was 2.9 against 3.3 on November 1 and 3.1 on March 15, 1931.

*Switzerland* : The last months of the winter were relatively severe and owing to the prolongation of the cold weather growth was greatly retarded. Grass is only be-

ginning to grow and it is feared that on both permanent and temporary meadows it will suffer somewhat from the frosts and biting winds of recent weeks. Crop condition on 1 April was as follows :

	<u>1932</u>	<u>1931</u>	<u>1930</u>	<u>1929</u>	<u>1928</u>
Permanent meadows. . . . .	3.5	3.6	4.1	3.9	4.1
Temporary meadows. . . . .	3.4	3.6	4.1	4.0	4.1

The following table is based on the 978 replies received by the Swiss Peasant's Secretariat in answer to an inquiry on the hay supply situation.

	<u>1931-32</u> Replies	<u>%</u> of total 1931-32	<u>%</u> of total 1930-31	<u>In previous years</u>	
				<u>1929-30</u>	<u>1928-29</u>
Insufficient . . . . .	142	14.5	0.8	4.7	25.8
Sufficient . . . . .	610	62.1	61.0	74.5	72.1
Available for sale. . . . .	226	23.1	38.2	20.8	2.1

It is seen from these data that the situation of hay supplies this year is less satisfactory than in the previous two years as about one-seventh of the reports received indicate inadequate supplies. It seems, however, that it should be possible largely to meet requirements in the country itself as 23 % of the correspondents reported stocks available for sale in their respective areas. As pasture is backward in growth the demand for hay and aftermath has recently been larger and stocks should consequently be considerably reduced. The return of cold weather and snow at the end of March did in fact bring about an increased demand for hay and prices generally strengthened.

*Argentina* : Rains in the first half of March have in general improved the fodder crop situation. At present pastures are again greening and the germination of fodder cereals is very vigorous. Only in the Pampa is growth slow and the pastures in this region on the whole provide inadequate feed.

*United States* : According to a report of farmers' intentions to plant as on March 1 published by the Department of Agriculture the acreage which it is intended to sow to tame hay this year is 54,195,000 or 1.4 % more than that harvested in 1931. As intentions usually exceed the acreage harvested, the acreage to be cut in 1932 will probably be about 53,834,000 or much the same as last year.

*Palestine* : There is a considerable shortage of *tîln* (straw fodder) and the market price is abnormally high, owing to the prolonged drought. Given present weather conditions, grain crops are expected to be poor and the yield of straw negligible. The amounts of *tîln* stored have been consumed owing to general lack of early pasture throughout Palestine. On the contrary, the hay crop of oats and vetch mixture is fair. Bersim also is good ; the second growth is normal and rain will greatly benefit the crop.



*Algeria* : Preparation of the soil and sowings of fodder beet have been made in very good conditions. Sown fodders have a good appearance.

Growth of pasture which was seriously checked by the cold made great progress in March.

*Egypt* : The third and fourth cuttings are in progress. Grain is forming and is about to ripen in the few areas devoted to production for seed.

Crop condition of bersim on April 1 was 100, as on March 1, against 99 on April 1, 1931.

*French Morocco* : The very abundant rains of February and March have allowed pastures and meadows to recover rapidly. The average annual precipitation has been attained.

## LIVESTOCK AND DERIVATIVES

### World trade in dairy products in 1931.

*(Continuation from the March number)*

### III. MILK.

It is always comparatively difficult to obtain a general perspective of world trade in fresh milk, cream and the different kinds of preserved milk as it is distributed among a large number of countries, part of which are in the tropics, having statistics of varying completeness. It is now possible, however, to trace the chief lines of movement in the past year. World trade in milk, which on the average last year reached about double the average quantity in the period just before the Great War, has declined since the cours of 1930 and has above all suffered further losses owing to the general and growing economic crisis.

Of the *exporting countries*, Holland is by far the most important. The export trade in condensed, sweetened, skim milk is particularly of large and increasing importance. Exports of milk powder and sterilised milk were rather smaller last year than in 1930. The Dutch export trade in different kinds of milk in 1931 was not, however, on the whole unfavourable as may be seen from the table on page 262. The export of the United States, on the contrary, last year experienced a sharp setback, dried milk being the only product again exported in larger quantities. The Swiss export of condensed milk which, as in most of the other exporting countries, is the most important product, has in recent years constantly declined; this tendency is noticeable to a more marked degree in the fresh milk export. Switzerland in 1931 also exported comparatively small quantities of cream. The losses experienced by the Danish export trade are not very large whereas Canadian cream exports have in particular greatly declined. Canada was able, however, to dispose of rather more milk powder on the foreign market. The movement of the French milk export trade, especially as regards the very large export of fresh milk, has been comparatively favourable.

As regards the Irish Free State the position is similar; the falling-off in exports of condensed and dried milk is almost equivalent to the increase in cream and milk exports in the last year. The exports of condensed milk from the United Kingdom in 1931 fell off

*Exports of milk from the principal exporting countries*  
(in thousand pounds).

COUNTRIES — CLASSIFICATION	1931	1930	1929	1928
<b>NETHERLANDS.</b>				
Milk, not including condensed and sterilized milk . . . . .	1,750	236	92	20
Sterilized milk . . . . .	3,159	4,480	8,935	10,750
Cream . . . . .	4,616	2,172	1,876	
Condensed milk:				
<i>a</i> ) whole milk, sugared . . . . .	67,609	38,355	72,929	62,653
<i>b</i> ) skim milk, sugared . . . . .	208,716	275,080	269,818	266,815
<i>c</i> ) whole milk, unsugared . . . . .	49,055	38,742	35,008	24,172
<i>d</i> ) skim milk, unsugared . . . . .	4	82	218	637
Milk powder:				
<i>a</i> ) whole milk powder . . . . .	18,257	18,492	22,714	25,280
<i>b</i> ) skim milk powder . . . . .	11,105	13,644	11,632	8,281
<b>UNITED STATES.</b>				
Milk and cream, fresh and sterilized } thousand English gallons . . .	(84)	(157)	(150)	(104)
} thousand American gallons . .	(1011)	(189)	(180)	(125)
Milk and cream, condensed, sweetened . . . . .	19,324	29,618	41,242	38,763
Milk and cream, evaporated, unsweetened . . . . .	55,761	60,811	68,043	76,789
Milk and cream dried . . . . .	12,790	6,223	5,342	4,010
Infants' food, malted milk, etc. . . . .	1,698	2,471	2,126	2,185
<b>SWITZERLAND.</b>				
Milk, fresh . . . . .	4,057	12,039	20,851	28,332
Cream . . . . .	522	915	812	807
Milk, condensed, sterilized, etc. . . . .	63,431	72,660	78,476	82,252
<b>DENMARK.</b>				
Whole milk (without special treatment) . . . . .	207	—	37	558
Cream (without special treatment) . . . . .	1	0	0	0
Cream and condensed milk, etc. (hermetically sealed) . . . . .	49,232	51,915	51,935	52,598
of which: cream, unsugared . . . . .		5,296	1,259	3,675
whole milk, sugared . . . . .		10,035	10,363	10,121
whole milk unsugared . . . . .		5,236	4,176	2,474
skim milk, sugared and unsugared . . . . .		31,348	35,905	36,028
Dried milk, etc. (hermetically sealed) . . . . .	586	512	807	926
<b>CANADA.</b>				
Milk, fresh } thousand English gallons . . . . .	(474)	(1,176)	(3,292)	(3,960)
} thousand American gallons . . . . .	(569)	(1,773)	(3,053)	(1,756)
Cream . . . } thousand English gallons . . . . .	71	1,270	2,386	3,013
} thousand American gallons . . . . .	85	1,525	2,865	3,654
Milk, condensed . . . . .	8,206	11,981	17,853	20,125
Milk, evaporated . . . . .	6,252	8,489	8,893	6,601
Milk powder . . . . .	5,746	4,730	5,236	4,889
<b>FRANCE.</b>				
Ordinary milk . . . . .	31,881	28,073	27,423	
Milk, sterilized or peptonized, unconcentrated . . . . .	690	697	864	27,787
Cream, iced or other . . . . .	110	148	150	
Milk, concentrated, unsugared . . . . .	5,287	5,291	4,700	5,086
Milk, concentrated, sugared . . . . .	8,788	9,137	6,819	8,821
Lactinized flour, sugared . . . . .	1,036	1,199	694	386
<b>IRISH FREE STATE.</b>				
Milk, fresh (including separated and buttermilk), } thousand English gallons . . .	936	721	653	787
} thousand American gallons . .	1,124	860	784	945
Cream . . . . . } thousand English gallons . . .	894	764	808	932
} thousand American gallons . .	1,074	917	970	1,119
Milk condensed and dried . . . . .	6,985	10,321	10,503	10,746
<b>GREAT BRITAIN AND NORTHERN IRELAND.</b>				
Milk, condensed, not sweetened . . . . .	4,120	5,072	4,253	3,955
Milk, condensed, sweetened . . . . .	9,092	17,132	23,386	20,023
Milk powder, not sweetened . . . . .	...	497	692	621
Milk powder, sweetened . . . . .	...	1,048	1,002	0
Milk, preserved (other kinds), not sweetened . . . . .	...	237	93	168
<b>NEW ZEALAND.</b>				
Milk and cream, dried, powdered . . . . .	11,841	12,870	11,561	15,852
Milk and cream, condensed, preserved (not dried) . . . . .	1,004	2,331	2,175	1,367
<b>AUSTRALIA.</b>				
Milk and cream, dried, powdered, malted milk, etc. . . . .	...	2,611	3,557	2,671
Milk and cream, preserved, condensed, concentrated, sweetened . . . . .	...	11,381	17,824	19,984
Milk and cream, preserved, condensed, concentrated, not sweetened . . . . .	...	78	71	41

even more markedly than in 1930. New Zealand's exports of various kinds of preserved milk also showed a regression in the past year.

In addition to the above countries and Australia which is also included in the table on page 262, Norway, Belgium, Italy, Germany, Austria, Czechoslovakia and Lithuania have a noteworthy export of milk. Norway has in the last two years exported the following quantities in thousand pounds:

Year	Sterilized milk	Sterilized cream	Sweetened condensed milk	Unsweetened condensed milk	Dried milk, milk powder
1931 . . . . .	3,234	342	9,319	1,850	42
1930 . . . . .	4,473	445	10,853	2,595	49

In contrast to the milk export of Norway that of Belgium, as well as that of Italy, has increased. In 1931 Belgium exported 26,380 Imperial gallons (31,670 American gallons) of cream and milk against 25,940 (31,150) in 1930, 175,370 (210,600) gallons of buttermilk or whey against 53,830 (64,640) in 1930, and 9,542,000 lb. of preserved cream and milk against 7,300,000 in 1930, while Italy marketed abroad the following quantities in thousand pounds:

Year	Fresh or sterilized milk	Sweetened condensed milk	Unsweetened condensed milk	Unsweetened milk-powder	Sweetened lactinized flour	Milk sugar
1931 . . . . .	1,583	5,686	104	586	46	42
1930 . . . . .	853	4,921	106	115	44	51

The exports from Germany in 1931 of fresh, sterilized and peptonized milk amounted to 3,891,000 lb. (1930: 1,916,000) and that of cream to about 26,000 lb. (in 1930 over 66,000); on the other hand the export from Germany of condensed and dried milk, which last year was 2,840,000 lb., did not attain half the quantity exported in 1930 (6,773,000 lb.). For the rest, the exports of Austria, Czechoslovakia and Lithuania also showed a regression. Austria was able to export in 1931 only 218,950 (262,930) gallons of milk and cream against about 440,000 (530,000) in 1930 and 395,000 lb. of condensed and dried milk against 677 million in 1930. The export of Czechoslovakia (excluding insignificant quantities of condensed and dried milk) attained in 1931 only 3,455,000 lb. (7,169,000 in 1930). Czechoslovakia exported in 1931 a little more milk sugar than in the previous year (134,000 lb. against 99,000). The reduction in the export of milk from Lithuania has in recent years been particularly noticeable and the amount exported in 1931 amounted to only 2,729,000 lb. (1930: 10,864,000; 1929: 19,910,000).

Amongst these countries some are also important *importers of milk*, especially Great Britain, by far the greatest market for these products. The British market takes especially condensed milk but also much milk powder and cream. As will be seen from the table on page 264/265, Great Britain has in recent years shown a still greater absorptive capacity for condensed milk. In Europe, besides the United Kingdom, the countries with the greatest importance as markets for milk are France, Switzerland, Belgium, Greece and Germany; the imports into Switzerland consist almost entirely of fresh milk, while

## Imports of milk into the principal importing countries †)

(in thousand pounds).

COUNTRIES — CLASSIFICATION	1931	1930	1929	1928
GREAT BRITAIN AND NORTHERN IRELAND (1).				
Milk, fresh . . . . .	...	5,517	6,277	11,173
Cream . . . . .	...	15,078	15,433	16,496
Milk condensed, not sweetened . . . . .	53,337	41,687	44,898	47,266
Whole milk, condensed, sweetened . . . . .	259,195	25,179	28,893	33,185
Separated or skimmed milk, condensed, sweetened . . . . .		220,901	222,332	218,445
Milk powder, not sweetened . . . . .	...	26,108	27,514	20,112
Milk powder, sweetened . . . . .	...	1,609	1,845	6
Milk preserved (other kinds), not sweetened . . . . .	...	242	376	3,081
DUTCH EAST INDIES.				
a) Java and Madura ;				
Whole milk, condensed, sweetened . . . . .	5,450	6,446	7,394	6,958
Whole milk, condensed, not sweetened . . . . .	3,494	3,428	2,665	2,169
Skimmed milk, condensed, sweetened . . . . .	3,049	2,721	2,734	2,053
Milk, sterilized . . . . .	4,275	5,434	6,592	6,171
b) Exterior Provinces :				
Whole milk, condensed, sweetened . . . . .	...	14,484	16,610	16,023
Whole milk, condensed, not sweetened . . . . .	...	1,717	1,512	1,034
Skimmed milk, condensed, sweetened . . . . .	...	4,623	1,076	2,637
Milk, sterilized . . . . .	...	5,810	5,907	5,507
PHILIPPINES.				
Milk, fresh . . . thousand English gallons . . . . .	...	(210)	(271)	(219)
Milk, condensed, sweetened . . . thousand American gallons . . . . .	...	(253)	(325)	(299)
Milk, condensed, not sweetened . . . . .	...	9,129	9,511	8,217
Milk, evaporated . . . . .	...	10,917	20,364	18,307
Milk, powder . . . . .	...	333	187	143
INDIA.				
Milk, condensed and preserved (including cream) . . . . .	21,564	27,261	27,436	26,354
Milk, food for infants and invalids . . . . .	1,450	1,642	2,294	1,979
FRANCE.				
Ordinary milk . . . . .	3,195	600	328	822
Milk, sterilized or peptonized, unconcentrated . . . . .	79	110	231	
Cream, iced or other . . . . .	82	115	46	4,054
Milk, concentrated, unsugared, liquid or paste . . . . .	1,351	2,604	3,124	
Milk, concentrated, unsugared, solid (blocks, powder, etc.) . . . . .	4,103	2,736	2,238	8,545
Milk, concentrated, sugared, liquid or paste . . . . .	9,597	8,444	7,811	
Milk concentrated, sugared, solid (blocks, powder, etc.) . . . . .	2,467	1,182	1,303	620
Lactinized flour, sugared . . . . .	66	128	410	
JAPAN.				
Milk, condensed . . . . .	7,679	8,395	8,865	8,411
Milk, dried . . . . .	1,512	1,601	1,958	1,770
SWITZERLAND.				
Milk, fresh . . . . .	33,358	30,322	29,200	30,375
Cream . . . . .	7	7	7	4
Milk, condensed, sterilized, etc. . . . .	18	15	13	13
Milk sugar, whey powder . . . . .	51	44	40	62
BELGIUM.				
Cream and milk . . . thousand English gallons . . . . .	103	77	48	20
Buttermilk or whey . . . thousand American gallons . . . . .	124	92	57	25
Butter milk powder without the addition of other materials . . . . .	74	75	65	...
Cream and milk, preserved . . . . .	88	90	78	...
	864	289	134	...
	6,327	5,553	4,098	3,699

†) For Cuba and other important importing countries, see text. — (1) Re-exports have been deducted.

*Imports of milk into the principal importing countries (concluded)*  
(in thousand pounds).

COUNTRIES — CLASSIFICATION	1931	1930	1929	1928
GREECE.				
Milk, condensed or sterilized . . . . .	6,177	7,218	7,879	8,098
GERMANY.				
Milk, fresh, sterilized, peptonized (skim) . . . . .	10,514	33,530	58,036	54,540
Cream, fresh, sterilized, peptonized . . . . .	71	165	99	57
Buttermilk, whey . . . . .	49	3,230	3,047	1,909
Milk, condensed, dried (blocks and powder) . . . . .	1,967	4,352	8,265	13,290
Milk and cream, hermetically sealed . . . . .	214	170	185	791
UNITED STATES.				
Cream . . . { thousand English gallons . . . . .	(66)	(1,320)	(2,473)	(3,015)
{ thousand American gallons . . . . .	(79)	(1,585)	(2,970)	(3,621)
Milk . . . . { thousand English gallons . . . . .	(510)	(1,530)	(3,536)	(4,690)
{ thousand American gallons . . . . .	(612)	(1,837)	(4,246)	(5,632)
Milk, condensed and evaporated (1) . . . . .	(2) 1,245	910	2,430	2,351
Milk, dried and malted . . . . .	1,134	3,145	3,233	5,059

(1) Re-exports have been deducted. — (2) General import; corresponding figure for 1930. 1,611,000 pounds.

those into France, Belgium and Greece are mainly of concentrated milk. The milk import of Switzerland increased in 1931, as also that of France and Belgium; that of Greece showed, on the other hand, a regression. Germany, which has in recent years showed also an extraordinary decrease in its milk import, still takes besides condensed and dried milk large quantities of fresh or sterilized milk. Besides the countries figuring in the table on page 264/265, the Irish Free State, Hungary and Czechoslovakia take not unimportant quantities, especially of fresh milk. The fresh milk trade is essentially an exchange between neighbouring countries, overseas shipments play naturally a very restricted part.

After the European market, which has in general still showed a rather high absorptive capacity in recent years, the Asiatic market comes next in importance. The Netherlands East Indies, the Philippines, British India and Japan are very important importers of preserved milk. British Malaya, China, Siam, Indo-China, Ceylon and Cyprus are also important, though not included in the table on page 264/265. The import into the above-named Asiatic markets in 1931, showed as far as available data indicate, a predominant decline as is shown by the import statistics. When the statistics of the export countries are considered the same phenomenon is seen. The Netherlands exported to the Netherlands East Indies in the last two years the following quantities (in thousand pounds) :

Year	Whole milk condensed sweetened	Whole milk condensed unsweetened	Skim milk condensed sweetened	Sterilized milk
1931 . . . . .	2,833	1,980	3,796	1,528
1930 . . . . .	3,457	1,684	3,616	2,233

The condensed milk export from Switzerland to the Netherlands East Indies has decreased considerably more than that from the Netherlands, in fact from 8,232,000 lb. in 1930

to 4,253,000 in 1931. The United States in 1931 sent only 1,592,000 lb. of evaporated, unsweetened milk and cream to the Dutch East Indies against 1,976,000 lb. in 1930. The United States exported to the Philippines in 1931 only 6,539,000 lb. of condensed, sweetened milk and cream (in 1930: 7,364,000 lb.) and 18,036,000 lb. of evaporated, unsweetened milk and cream (in 1930: 18,011,000 lb.). The supplies drawn by the Philippines from other countries are of quite minor importance; Switzerland in 1931 sent there 1,984,000 lb. of condensed milk, a quantity a little larger than that of the previous year (1,687,000 lb.).

The Swiss export of condensed milk to the Straits Settlements decreased from 17,209,000 lb. in 1930 to 11,144,000 lb. in 1931 and that of the Netherlands to Malaya and North West Borneo from 25,594,000 lbs. to 22,525,000 lb. The export from the United States to British Malaya of evaporated, unsweetened milk and cream fell from 2,449,000 lb. in 1930 to 710,000 lb. in 1931.

On the Chinese market, milk imports from America are the most important. To China, Hong Kong and Kwangtung, the United States in 1931 shipped only 4,078,000 lb. of condensed, sweetened milk and cream (in 1930: 4,849,000 lb.) and 1,226,000 lb. of evaporated, unsweetened milk and cream (1930: 1,759,000 lb.). Chinese imports from the Netherlands and Switzerland have, on the contrary, increased. The movement of the Siamese import trade has been similar; the quantities supplied by the United States have decreased whereas those from the Netherlands have increased and the particularly large import into Siam from Switzerland in 1931 amounting to 5,251,000 lb. remained almost the same as in the previous year (5,296,000 lb.).

Swiss imports into Indo-China, for which Switzerland is also the most important supplier of milk, amounted to only 5,170,000 lb. in 1931 against 5,781,000 lb. in 1930. The Dutch milk import into Indo-China also showed a decrease.

The falling off in the milk import of the American consuming countries was last year especially marked. Cuba, one of the most important markets for condensed milk, which in 1929 took no less than 46,493,000 lb. of condensed and evaporated milk besides 922,000 lb. of milk in powder and other forms, already in 1930 lessened its demand for condensed and evaporated milk to about 38,801,000 lb. In 1931 the decline in imports was still more marked. The United States, generally the principal supplier of American markets, sent only 1,762,000 lb. of sugared condensed milk and cream to Cuba in 1931 against 8,146,000 lb. in 1930 and 15,662,000 lb. in 1929, and only 313,000 lb. of unsweetened evaporated milk and cream against 2,100,000 lb. in 1930 and 2,564,000 lb. in 1929. The Netherlands were much better able to maintain their position in the Cuban market, though they also suffered a considerable decline. The export of sweetened condensed whole milk from the Netherlands to Cuba in 1931 was only 6,956,000 lb. against 11,890,000 lb. in 1930 and 4,976,000 lb. in 1929. Certain of the other Antilles as well as Mexico and part of Central America are important markets for preserved milk. The export from the United States to these markets has in general also considerably declined. In Panama the United States succeeded in marketing only 239,000 lb. of sweetened condensed milk and cream in 1931 against 484,000 lb. in 1930 and 3,109,000 lb. of unsweetened evaporated milk and cream against 4,390,000 lb. in 1930. On the other hand the Netherlands increased their export of condensed milk to Panama and to British possessions in the Caribbean in the past year. To the British West Indies and the Bermudas as well as to Porto Rico there were also larger quantities of condensed and evaporated milk exported from the United States in 1931 than in the previous year. In South America Peru is a specially important market for unsweetened preserved milk; the export from the United States thither, as to South America generally, in the last year fell off markedly, while that of the Netherlands to Peru showed a considerable increase. The rise in the milk export of the Netherlands to Peru and Panama was

equivalent to the decline in that of the United States to these countries ; as in some of the East Asiatic countries there has thus been a certain loss of markets in the American countries for the United States export trade, in contrast to the progress made by the chief European exporters. The United States exported to Hawaii 8,380,000 lb. of evaporated and condensed milk in 1931, that is, more than in 1930 (7,093,000 lb.), to Alaska 5,029,000 lb., that is, less than in 1930 (5,361,000 lb.). The milk import of the United States is given in the table on page (264/265). The extraordinarily heavy fall in the United States milk import is partly to be traced to the tariff increase of June 1930, which has especially affected Canada as the principal source of foreign supplies.

In Africa, French North Africa is a very important market for milk and its capacity for absorption appears to be increasing. France in 1931 exported to Algeria 2,926,000 lb. of sweetened, concentrated milk against 2,213,000 lb. in 1930 ; there are, of course, other kinds of milk which are important on this market. The quantities of condensed milk taken by Algeria from Switzerland and the Netherlands, which are smaller than those derived from France, decreased in 1931. The very large Swiss export of condensed milk to West Africa also declined last year (1931 : 2,681,000 lb. against 3,214,000 lb. in 1930). The Union of South Africa imported an exceptionally restricted quantity of condensed milk (1931 : 2,474,000 lb. against 4,291,000 lb. in 1930) ; the increase which has taken place in the import requirements of the Union of milk powder (1931 : 221,000 lb. ; 1930 : 151,000 lb.), is in comparison of little consequence.

As regards the *distribution of milk exports from the principal exporting countries to the different countries of destination*, the following comments may be made. By far the best market of the Netherlands is Great Britain which takes from the former country chiefly sweetened, condensed skim milk in growing quantities. The Dutch production of sweetened, condensed whole milk is principally exported to the tropical regions of Asia and America but also largely to Great Britain which is also the best customer for Dutch unsweetened, condensed whole milk. Last year 75 % of the Dutch condensed milk export, according to value, was disposed of in Europe. Holland's export of milk powder is destined almost exclusively to European markets, especially Great Britain and France.

The most important customers for sweetened, condensed milk and cream exported from the United States in 1931 were the Philippines, China (including Hong Kong and Kwangtung), Japan, Cuba and Hawaii, and for unsweetened, evaporated milk and cream, in the first place Great Britain and the Philippines, followed by Hawaii, Alaska, Porto Rico, Panama and Japan. The export from the United States, to Great Britain showed a strong increase last year. The most important markets for Swiss condensed milk, apart from France, Great Britain and Greece, are, in the first place, the regions of southeast Asia while the United Kingdom is also the largest customer for Danish condensed milk. Canada exports condensed milk chiefly to American regions such as the British West Indies. Evaporated milk is also sold in large quantities by Canada on American markets and to an increasing extent in Great Britain, which is the best customer for Canadian milk powder. Fresh milk and cream is exported by Canada to the United States. A large part of the French milk export is destined to French North Africa and that of the Irish Free State predominantly to the United Kingdom. Great Britain also exports considerable quantities of preserved milk chiefly to Empire countries India being one of the most as important customers. The export of preserved milk from New Zealand is directed predominantly to Great Britain whereas that of Australia is, on the contrary, placed chiefly on the neighbouring markets of East Asia.

The supply of Great Britain, by far the most important importing country, with condensed milk is met only in small part by Empire lands ; the share of these coun-

tries, especially New Zealand and Canada in the imports of milk powder into Great Britain is nevertheless considerable. The Netherlands supplied in the past year 64 % of the total imports of sweetened, condensed whole milk into the United Kingdom, 87 % of the sweetened condensed skimmed milk and 32 % of the unsweetened condensed (evaporated) milk ; of the last named product 34 % was supplied to the United Kingdom by the United States. As regards milk powder the Netherlands after New Zealand are the most important source of Great Britain's supplies. In recent years cream has been supplied principally from the Irish Free State, Denmark and the Netherlands, fresh milk from the Irish Free State and in 1931, in small quantities also from the Netherlands, France, Denmark and Norway.

I. P.

### Condition of Livestock and Dairy Production.

*Belgium* : Health is good.

*Irish Free State* : Owing to the exceptionally dry cold weather in March pastures became bare and in some cases water for the animals had to be transported to the fields. The harsh weather had an unfavourable effect on milk production and yields were somewhat below normal for the month. Supplies of fodder and roots are ample for all normal requirements.

*France* : The drought and prolonged cold up to the end of March had a deleterious effect on stock-rearing and especially on the revival of fattening. Thanks to the plentiful reserves of fodder from last season condition of stock remained good but fears are entertained regarding the consequences of the abnormal winter, which has already delayed the putting of animals to grass. The fodder crop produced under such poor conditions may have very unfavourable repercussions on the stock-rearing season. Prices for cattle strengthened in February and March and toward the end of the latter month there was a slight upward tendency.

*Great Britain and Northern Ireland* : Supplies of winter feed are likely to be sufficient unless there is a very late spring. A scarcity of bray is, however, reported from Scotland.

Milk yields are generally normal though in England and Wales the effects of poor quality hay are still evident in some parts of the country and in Scotland the yield has been slightly above the normal for the season in a few districts. Both cattle and sheep have done fairly well, though in Northern Ireland more hand-feeding than usual was necessary owing to the scarcity of grass. In England and Wales lambing made good progress, the fall of lambs being quite up to average, while in Northern Ireland it is expected to be satisfactory and equal to that of 1931.

*Hungary* : Due to fodder shortage the livestock situation is not everywhere good.

*Switzerland* : Milk production is above that of last year. In all districts deliveries are larger than in the first quarter of 1931. Deliveries to cheese factories and milk depots showed for each month the following increases on those for the corresponding months of 1931 : January 2.3 %, February 6.3 %, March 4.2 %.



*Argentina* : The health of livestock varies from good to excellent. Breeding results are normal.

*United States* : According to a report of March 11 published by the Department of Agriculture, the early lamb crop in the principal early lambing States as a whole is somewhat smaller than the early crop of 1931, the decrease being indicated at 3-5 %. In general and especially in the West where the weather has been unfavourable and feed supplies short, the condition of early lambs at the beginning of March this year was not so good as a year earlier, at which date a high condition was reported from all States. Moisture conditions this year are, however, much more favourable for spring feed in all States.

In the week ended on March 31 pastures east of the Mississippi varied from poor in some southern portions to good for the season in the Ohio Valley. Grass was greening well in the Northern Great Plains. Range grass was starting in some northern Rocky Mountain sections. Water conditions were largely satisfactory in the Southwest and the range was improving. Rain was needed in California.

East of the Mississippi pastures in the week ended on March 31 varied from poor to good. In the Northern Great Plains conditions were more favourable for livestock. Grazing was possible in some northern Rocky Mountain sections but in other districts snow still covered the range, with a consequent shrinkage of stocks and some feeding was still necessary.

*Palestine* : Until the latter part of February grazing was very poor and the mortality noted among goats and sheep can be attributed to starvation followed by inclement weather. Warmer weather following heavy rain improved conditions appreciably for the time being.

*Algeria* : March brought considerable improvement in condition of the herds, which was seriously jeopardized by the early drought, the severity of the prolonged winter and the absence of nourishment in the pastures ; in certain areas there was a 15-20 % mortality amongst sheep, particularly lambs.

At the beginning of April health was generally satisfactory and maintenance conditions had returned to normal, thanks to the favourable weather in March, which allowed the grass to recover.

According to information from private sources, the number of sheep fell in 1931 to 4,670,795 head from 7,168,801 in 1930 ; this reduction is known to be due to considerable losses of animals in the autumn drought of 1930 and the severe winter which followed.

Wool production has dropped sharply from 49,266,000 lbs. in 1930 to 28,094,000 in 1931.

*French Morocco* : Livestock, of which the condition was bad at the beginning of February owing to the prolonged drought, the impoverishment of pastures and the exhaustion of fodder reserves, recovered gradually thanks to abundant rains in February and March. The industry will this year, however, inevitably show the effects of the unfavourable winter.

*Union of South Africa* : Rains fell in February over a great part of the area, particularly abundantly in Natal, the greater portion of the Free State, the south-eastern portion of the Transvaal, the Western Transvaal highveld and Bechuanaland. General conditions in the Karroo and in the Eastern Cape Province were particularly favourable ; stock and veld were in good condition and land was being prepared extensively for winter feed. In the Cape North-west districts, however, despite some rains, trekking in search of fresh pasturage was still necessary.

*New Zealand* : For the first six months of the 1931-32 season, that is from August to January, butter production was 7.4 % above that for the same period in 1930-31. Cheese production for the six months showed, however, a fall of 7.6 %. The customary falling-off in production of both butter and cheese was recorded for January, though compared with that of January 1931 the grading figure for butter shows an increase of 5.8 %.

### Number of Pigs in Germany on 1 March 1932.

At the time of the last enumeration in December a slight increase in the total number of pigs with respect to the enumeration of the previous December was indicated, the number at the beginning of March 1932 shows, however, a decrease in comparison with that at the corresponding date last year. The end of an ascending movement that has been uninterrupted for two years has thus been reached.

In consequence of the large winter slaughtering there was up to the time of the March enumeration a regression in the total from that of the beginning of December in the pre-

#### *Numbers of pigs in Germany (1).*

CLASSIFICATION BY SEX AND AGE	I March 1932	I Dec. 1931	I Sept. 1931	I June 1931	2 March 1931	I Dec. 1930	I Sept. 1930	2 June 1930	I March 1930	2 Dec. 1929	2 Sept. 1929	I June 1929	I Dec. 1928
(1000 head).													
<i>Totals</i> . . . . .	20,633	23,783	25,348	22,529	21,790	23,442	23,423	19,805	18,649	19,944	19,604	16,795	20,106
<i>Sucking pigs under 8 weeks of age</i> . . . . .	1,013	5,125	6,304	6,027	5,750	5,469	6,522	5,091	5,012	4,417	5,373	4,160	4,003
<i>Young pigs from 8 weeks to 6 months of age</i> . .	9,976	10,469	10,980	10,351	10,231	10,035	9,809	9,178	8,555	8,693	8,290	8,099	8,487
<i>Pigs from 6 months to 1 year of age</i> . . . . .	3,853	5,771	5,391	4,172	3,939	5,484	5,125	3,842	3,487	4,599	4,288	3,060	5,129
Of which :													
Boars for service . . .	47	52	51	54	58	61	57	57	54	56	50	48	53
Sows for breeding (total)	549	495	589	603	706	674	812	876	722	663	652	671	556
Sows covered . . . .	(323)	(251)	(276)	(409)	(425)	(369)	(442)	(574)	(455)	(383)	(363)	(405)	(312)
Other swine . . . . .	3,257	5,228	4,771	3,425	3,176	4,749	4,256	2,909	2,712	3,880	3,585	2,841	4,520
<i>Pigs, 1 year old and over.</i>	1,791	2,414	2,173	1,979	1,870	2,455	1,967	1,694	1,695	2,235	1,653	1,475	2,487
Of which :													
Boars for service . . .	67	63	73	71	62	60	61	57	51	50	58	55	52
Sows for breeding (total)	1,425	1,458	1,661	1,663	1,517	1,503	1,467	1,356	1,229	1,179	1,208	1,145	1,063
Sows covered . . . .	(875)	(869)	(902)	(1,021)	(927)	(942)	(861)	(915)	(792)	(775)	(787)	(787)	—
Other swine . . . . .	299	893	439	246	291	892	440	280	315	1,006	387	275	1,372

(1) Present territory, excluding the Saar.

vious year. If the totals for March are compared in each case in the following table with those for the preceding December it will be seen that the regression is this year particularly marked. The number of pigs in March 1932 was 13.2 % less than that in the preceding December, while in March 1931 and March 1930 it was only 7.0 % and 6.5 % less respectively. The seasonal decrease in the total since the last estimate is thus greater than usual, which was to be expected from the decrease in the number of brood sows.

Comparison of the figure for pigs over six months available for slaughter at the beginning of March 1932 with the corresponding figure at the beginning of March 1931 shows an increase of 2.5 %, while at the same time young pigs of eight weeks to six months destined for slaughter in summer or autumn have increased by 2.5 % and sucking pigs of eight weeks, which will be ready for slaughter at the end of the year, by even 12.8 %.

As after the new enumeration the number of sows in litter was less than a year ago the number of sucking pigs will be at first relatively reduced, as also that of pigs available for slaughter at the beginning of the next year. It may be believed that this situation will have in the near future a favourable repercussion on the price of pork. It is evident that breeders are taking this into account for it should be particularly noted that the increase in sows in litter was much greater for the three months from the beginning of December 1931 to the beginning of March 1932 (6.9 %) than for the corresponding period a year previously (3.2 %). This is the first sign of a fresh recovery not yet apparent in the increase of the total number of brood sows.

### Livestock in Belgium.

In the following table are given the numbers of livestock in Belgium on December 31, 1931 compared with a series of preceding years and the pre-war period :

*The numbers of livestock in Belgium in 1931 and previous years.*

YEAR	Horses (1)			Cattle			Pigs				Total
	under 3 years of age	over 3 years of age	Total	under 2 years of age	dairy cows	other cattle over 2 years of age	Total	under 6 months of age	over 6 months of age	of which store pigs (tatten- ing)	
1931 . . .	98,663	145,326	241,989	738,740	930,980	97,866	1,767,536	672,902	562,312	420,114	1,235,214
1930 . . .	98,184	147,787	245,971	732,437	925,556	100,661	1,758,654	680,867	568,754	424,066	1,249,621
1929 . . .	99,564	149,450	249,014	727,208	911,720	99,420	1,738,348	675,374	561,628	421,252	1,237,002
1928 . . .	103,392	149,022	253,314	743,651	907,730	99,160	1,750,541	621,362	517,760	385,020	1,139,131
1927 . . .	101,978	154,487	256,465	735,462	901,902	101,450	1,738,814	609,824	514,419	381,347	1,124,243
1926 . . .	100,356	149,931	250,287	719,083	891,786	100,833	1,711,702	626,730	517,130	386,564	1,148,860
1925 . . .	100,721	149,303	250,024	696,277	856,352	102,138	1,654,767	625,541	526,178	393,074	1,151,719
1924 . . .	101,055	151,250	252,314	683,186	839,076	105,393	1,627,655	625,961	513,112	385,325	1,139,073
1923 . . .	96,349	146,835	243,184	675,204	820,692	106,832	1,602,728	652,467	523,963	394,867	1,176,430
1922 . . .	88,206	142,245	230,451	628,206	787,092	101,471	1,516,760	625,073	513,714	394,462	1,139,387
1913 . . .	95,472	171,688	267,160	779,950	936,800	132,734	1,849,484	746,674	665,619	—	1,412,293

(1) Horses employed in agriculture.

Compared with the preceding year there is seen to have taken place in 1931 a slight increase in the number of cattle and decreases for horses and pigs.

Since 1929 the total number of horned cattle has increased regularly, the figure for 1931 representing 95.6 % of that for 1913.

Dairy cows, which constitute over one-half of total cattle, have increased constantly in number during the last decade. In fact, their number in 1931 exceeded that in 1922 by 18.3 % and almost reached the figure for 1913 (— 6,000 head).

As regards pigs, the table shows the increase which has taken place on the last decade. The progress in numbers has been irregular, the only really large increase recorded being that for 1929 in which year pigs increased by nearly 100,000 head on the previous year.

The number of horses employed in agriculture, on the contrary, has decreased continually since 1927. This phenomenon is due to the substitution of agricultural machinery for horses.

### Livestock in Lithuania.

In the following table are published the numbers of livestock in Lithuania at the end of 1931 with comparative figures for the seven preceding years.

YEAR	Horses	Cattle		Sheep	Pigs	Poultry	
		Total	Milch cows			Fowls	Geese
1931 . . . . .	592,170	1,110,080	602,800	601,780	1,337,580	3,740,640	241,570
1930 . . . . .	559,000	1,170,000	606,000 (*)	1,097,000	1,136,000 (†)	2,262,000 (†)	795,000
1929 . . . . .	588,300	1,160,100	601,800 (*)	1,125,300	943,600 (†)	2,010,000 (†)	623,500
1928 . . . . .	611,400	1,199,300	689,500 (*)	1,407,800	1,000,400 (†)	2,213,800 (†)	873,300
1927 . . . . .	617,200	1,128,900	— (*)	1,409,500	1,009,500	—	—
1926 . . . . .	535,000	1,396,000	— (*)	1,573,200	1,441,300	—	—
1925 . . . . .	497,000	1,339,000	— (*)	1,455,000	1,488,000	—	—
1924 . . . . .	482,000	1,252,000	— (*)	1,390,000	1,561,000	—	—

(\*) Sheep and goats. — (†) Laying hens and geese on rural holdings.

Horses, of which the number increased continuously from 1924, attained their maximum in 1927 and then began to decline; 1931, however, shows a recovery with a figure 5.9 % above that of 1930.

Cattle, after registering a maximum in 1926, have decreased since then almost continuously save for slight recovery in 1928 and 1930. In 1931 the regression continued with a further decline of 4.3 % from the previous year.

Pigs decreased from 1924, the decline being particularly accentuated in 1927. After a slight recovery in 1928 and a further decline in 1929, noticeable also in Estonia and Latvia, pig-rearing was intensified in 1930 and in 1931 the advance is still clearer, being 17.7 % on the number in 1930.

Poultry-rearing continues its upward trend without interruption; the efforts of poultry-farmers appear to be concentrated chiefly on fowls, of which the number, after a decline in 1929 increased considerably in 1931, exceeding that of 1928 by 69.0 %; on the other hand the rearing of geese shows a heavy fall, the figure for 1931 representing only 27.7 % of that of 1928, the first year for which data are available.

# Livestock in Czechoslovakia.

In the following table are published the provisional results of the annual enumeration of livestock on 31 December 1931 compared with the final data of the enumeration of 1930; for 1930 there are also indicated the provisional data of the census of 27 May and for 1925 and 1920 those of the census of 31 December.

YEARS	Cattle		Sheep	Pigs	
	Total	Cows		Total	Brood sows of 6 months and avse
1931 (31·XII) . . . . .	4,448,048	2,459,089	580,624	2,570,147	348,189
1930 (31·XII) . . . . .	4,457,522	2,433,830	607,812	2,776,215	441,821
1930 (27·V) . . . . .	4,538,904	—	886,049	3,088,025	—
1925 (31·XII) . . . . .	4,691,820	2,331,461	861,128	2,539,201 (1)	304,559
1920 (31·XII) . . . . .	4,376,765	2,027,847	985,526 (2)	2,052,687 (1)	371,895

(1) Sows for breeding of oves one year. — (2) Not including «othres pigs oves one year» (10 %).

The data of the annual enumeration of 1931 show in comparison with the corresponding data of 1930 that there has been scarcely any change in the number of cattle, the total having diminished by only 0.3 %, that of cows having increased by 1.0 %. On the other hand the number of sheep has diminished by 12.7 % and there has also been a considerable diminution (7.4 %) in the total number of pigs. This regression is still more accentuated in the case of sows of six months and over for breeding, reaching 21.2 %. The percentage of sows of six months and over for breeding in relation to the total of pigs has fallen from 15.9 in 1930 to 13.5 in 1931.

It must, however, be noted that the slaughter of native pigs in 1931 was considerably above that in 1930, which had already exceeded the figures for the years 1924 to 1929; in 1931 there were slaughtered 4,096,522 native pigs against 3,380,700 in 1930 and 3,091,642, the average of the seven years 1924 to 1930.

In comparison with the data for 1925 and 1920 those of 1931 show a continuous increase in the number of cows and a steady and considerable decrease in that of sheep.

## Government measures for the development of stockrearing in the U. S. S. R.

After the creation of the great State holdings (*soukhosi*) for agricultural production the Government began also to organize *soukhosi* for stockrearing, with a view to surmounting the crisis in that industry, which had become more acute simultaneously with the rapid extension of collectivisation and consequent sharp reduction in numbers of livestock.

During the last two years a vast network of large State holdings for stockrearing was created, comprising 1,480 holdings with 2,500,000 cattle, 860,000 pigs and 4,700,000 sheep. The experience of the two years has emphasised the fact that the defects in the organisation of these holdings, due partly, however, to their excessive size, are numerous. Following on a decision at the end of the last month, the basic features of a reorganisation have been defined and the numbers of stock have been considerably reduced in comparison with those previously fixed.

1) On holdings devoted to cattlerearing for meat the number is not to exceed 3,000 to 8,000, according to local conditions.

2) On holdings devoted to milk production the number of cows is not to exceed 1000 and in subsidiary holdings 200 to 400 cows.

3) On holdings concerned with sheeprearing the total is not to exceed 50,000 in the case of ewes for ordinary wool and 10,000 in the case of those for fine wool.

4) On holdings for pigrearing the number is fixed in the zone of cereal consumption, in White Russia and Transcaucasia at 400 brood sows, in the Ukraine and the Central Chernozym Region at 700 and in other regions at 1000; subsidiaries of the various holdings are not to maintain more than 100 to 150 sows for breeding.

During the current year it has been decided to restrict the creation of new *soukhozi* for stockrearing as follows: 20 in the case of cattlerearing for meat, 22 in the case of cattlerearing for milk and 16 in the case of sheeprearing. In these figures the *soukhozi* to be organised following on the reduction in size of existing *soukhozi* are not, however, included. The reorganisation is to be completed by 1 August 1932.

Another decision refers to the collectivisation of cows. As is well-known the collectivisation of individualistic holdings extends over the whole country. The fundamental form of this collectivisation is the *artel* in which are collectivised the principal commodities of agricultural production leaving, however, to each member of the *artel*, for personal use, a cow, small stock, poultry and the land surrounding the house.

Lately, however, the movement for the extension of compulsory collectivisation to all cows has developed in several regions. At the end of March a decree was promulgated according to which this collectivisation of all cows should not only cease but that each *artel* should, on the contrary, see that each of its members had for his own use a cow, small stock and poultry.

### Livestock in Canada.

On March 22 the Dominion Bureau of Statistics published its annual report, based on the usual survey, on the numbers of farm livestock and poultry in Canada on June . The data of this report are given in the following table compared with the corresponding data for the previous five years.

*Livestock and poultry in Canada on June 1 according to the ordinary annual survey.*

	1931	1930	1929	1928	1927	1926
			(thousands)			
Horses . . . . .	3,129	3,295	3,377	3,376	3,422	3,398
Cattle . . . . .	7,991	8,937	8,825	8,772	9,150	8,571
Cows kept mainly for milk.	3,513	3,683	3,685	3,782	3,883	3,839
Sheep . . . . .	3,608	3,696	3,636	3,416	3,263	3,143
Swine . . . . .	4,717	4,000	4,382	4,497	4,695	4,360
Poultry . . . . .	65,468	60,795	59,933	53,780	50,178	50,108
Hens, etc . . . . .	61,572	56,247	55,243	49,593	46,172	46,096
Turkeys . . . . .	2,232	2,399	2,423	2,066	1,890	2,088
Geese . . . . .	904	1,160	1,155	1,125	1,135	1,011
Ducks . . . . .	760	989	1,112	996	981	913

From the table it may be noted that the tendency to decline in the number of horses noted in the last few years, was continued in 1931. Cattle were reduced by about a million head from 1930 to 1931, reaching quite a low point, but of the total cattle, the number of cows kept mainly for milk was well maintained at 3,513,000 head as against 3,683,000 in 1930. Sheep have not varied greatly in number since 1929. In contrast to the case for other livestock, swine and total poultry showed substantial increases in numbers over 1930. The increase in poultry flocks was due exclusively to hens as other kinds all recorded decreases; the number of hens has, in fact showed a large and progressive increase for some years past, reaching over 61 million head in 1931 as compared with about 46 million in 1926, an increase of roughly  $\frac{1}{3}$  in five years.

The preliminary data of the decennial census of June 1931 are practically identical with the above data of the June annual survey. According to the census, the number of mules in June 1931 was 6,460 head and the number of hives of bees 183,981.

As regards the annual survey, in order to improve Canadian livestock statistics and to obtain a better perspective of the livestock industry, the Dominion Bureau of Statistics in 1931 inaugurated a second series of livestock surveys as on December 1 and in future will continue to publish bi-annual reports on livestock in Canada as on June 1 and December 1.

The first results of the survey of December 1, 1931 for the Prairie Provinces, compared with the census data of June 1931 for the same provinces are given in the following summary: (According to the census, the Prairie Provinces last June possessed 37.6 % of the total Canadian cattle, 50.7 % of the total swine and 35.5 % of the total sheep).

	Cattle —	Swine —	Sheep —
PRAIRIE PROVINCE:			
June (Census, 1931) . . . . .	3,003,764	3,390,990	1,282,310
December (Annual survey 1931) . . . . .	2,915,100	2,058,900	988,000

The figures do not indicate a lower trend in livestock production as the decreases from June to December are largely seasonal, due to heavier marketings in this period; moreover in the latter half of the year there are few additions to numbers as, owing to the climatic conditions prevalent in Western Canada, most births, especially of lambs, occur in the spring.

### Livestock in Uruguay.

Below are given the results of the 1930 census for pigs, asses and mules compared with those of the preceding census of 1924.

Classification —	1930 —	1924 —
	(Head)	
Pigs . . . . .	307,924	251,158
Asses . . . . .	3,838	2,232
Mules . . . . .	11,150	16,344

From an examination of the data there are seen to be for 1930 increases of 56,671 and 1,606 head respectively in the number of pigs and asses whereas for mules a decrease of 5,194 head is recorded.

As regards sex and strain, the 1930 census gives the following classification for pigs :

	1930 — (Head)
<i>According to sex :</i>	
Boars . . . . .	21,235
Sows, for breeding purposes . . . . .	60,693
Pigs, for fattening . . . . .	105,876
Pigs, under 1 year of age . . . . .	120,120
<i>According to strain :</i>	
Crossbred . . . . .	237,350
Pure strain . . . . .	60,456
Berkshire . . . . .	1,008
Yorkshire . . . . .	57
Duroc Jersey . . . . .	53

### The New Zealand Dairying Industry in 1930-31.

In the main substantial decreases characterise the figures relating to the New Zealand dairying industry in 1930-31 as compared with the figures for 1929-30. The number of factories in operation declined from 491 to 482, while the number of persons finding employment receded by 1 %. The cost per lb. of butterfat purchased by factories dropped by 27 % and the total value of products per pound of butter fat by 22 %.

During 1930-31 butterfat aggregating 296,187,000 lb. was sent to dairy factories, 3 % more than in the previous year. Of this amount 71 % was used for butter and 27 % was contained in milk used for making cheese, while the remaining 2 % was used for condensed and dried milk and other purposes. The quantities used for butter and cheese were respectively 2 % and 5 % above those for 1929-30; the butterfat used for the manufacture of condensed and dried milk decreased by 13 %. The quantity of milk used for cheesemaking increased by 3 %.

The production of butter was 2,306,842 cwt., an increase of 2 % on that of 1929-1930, and the production of cheese 1,857,852 cwt., an increase of 4 %. Values, however, declined sharply, that of the total butter production by 18 %, that of total cheese production by 30 %.

The average weight of milk required to produce a pound of cheese declined from 9.55 lb. to 9.38 lb., that is by 2 %, while the weight of cheese obtained per 100 lb. milk rose 2 % from 10.47 lb. to 10.66 lb. The average yield of butter per pound of butterfat rose 1 % from 1.22 lb. to 1.23 lb.



## TRADE

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-End February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat. — Thousand centals (1 cental = 100 lbs)</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	703	9	0	0	4,070	386	0	0	3,234	0
Hungary . . . . .	99	240	0	0	6,594	3,993	0	0	5,247	0
Lithuania . . . . .	7	106	0	0	9	359	0	0	545	0
Rumania . . . . .	—	—	—	—	(1) 19,332 (1)	6,404 (1)	0 (1)	7	9,054	9
U. S. S. R. . . . .	—	—	—	—	(2) 22,919 (2)	14,617	—	—	67,735	—
Yugoslavia . . . . .	179	0	0	0	6,841	2,760	0	0	3,247	0
Canada . . . . .	5,939	6,177	2	7	68,610	89,157	51	40	137,150	79
United States . . . . .	2,789	82	465	604	33,193	26,923	4,923	7,394	46,229	11,616
Argentina . . . . .	10,496	10,375	—	—	35,706	26,868	—	—	71,553	—
Chile . . . . .	2	22	0	0	4	423	0	0	428	0
Turkey . . . . .	128	4	0	0	489	168	0	7	285	7
Algeria . . . . .	—	—	—	—	(3) 1,501 (3)	4,682 (3)	322 (3)	88	5,706	1,371
Tunis . . . . .	40	33	31	97	1,618	1,239	293	273	3,704	542
Australia . . . . .	10,979	9,412	0	0	37,615	33,043	0	0	76,505	0
<i>Importing Countries:</i>										
Germany . . . . .	154	11	1,574	974	7,072	247	10,386	10,587	265	18,805
Austria . . . . .	0	0	320	397	0	84	4,072	2,500	86	5,315
Belgium . . . . .	370	196	1,831	1,987	2,496	590	17,990	16,614	2,079	31,184
Denmark . . . . .	0	4	337	203	9	20	6,183	2,414	35	4,877
Spain . . . . .	0	0	0	0	0	4	35	0	4	0
Estonia . . . . .	0	0	13	2	0	0	163	269	0	370
Irish Free State . . . . .	—	—	—	—	(1) 7 (1)	18 (1)	3,311 (1)	3,640	18	6,485
Finland . . . . .	0	0	11	11	0	0	247	42	0	90
France . . . . .	0	0	2,427	2,950	9	944	24,544	20,514	966	46,806
Gr. Brit. and N. Ir. . . . .	18	42	9,520	5,990	276	452	54,071	73,538	683	124,551
Greece . . . . .	0	0	1,248	1,008	0	0	8,126	7,513	0	14,233
Italy . . . . .	0	0	1,616	3,235	18	22	6,094	27,534	18	50,116
Latvia . . . . .	0	0	44	108	0	0	311	736	0	1,030
Norway . . . . .	0	0	399	150	0	0	2,174	2,044	0	3,123
Netherlands . . . . .	13	214	1,396	1,032	90	430	9,837	10,750	683	16,568
Poland . . . . .	154	117	0	2	425	1,193	324	35	1,847	49
Portugal . . . . .	—	—	7	20	—	—	478	159	—	1,316
Sweden . . . . .	—	—	—	—	(1) 1,956 (1)	24 (1)	1,956 (1)	1,307	31	2,879
Switzerland . . . . .	2	0	580	714	7	0	8,093	7,083	2	11,096
Czechoslovakia . . . . .	0	0	755	35	2	2	8,201	4,566	4	7,079
British India . . . . .	4	24	0	1,479	161	1,914	179	3,439	2,251	6,687
Japan . . . . .	—	—	—	—	—	—	(1) 5,710 (1)	5,467	—	15,311
Syria and Lebanon . . . . .	2	0	11	0	428	99	18	33	137	44
Egypt . . . . .	—	—	—	—	(1) 0 (1)	2 (1)	243 (1)	505	2	1,019
Union of South Africa . . . . .	—	—	—	—	(3) 0 (3)	0 (3)	518 (3)	611	0	1,801
New Zealand . . . . .	—	—	—	—	(3) 0 (3)	0 (3)	53 (3)	64	0	128
<b>Totals . . . . .</b>	<b>32,078</b>	<b>27,068</b>	<b>22,667</b>	<b>20,735</b>	<b>249,501</b>	<b>217,501</b>	<b>269,411</b>	<b>210,442</b>	<b>439,713</b>	<b>384,139</b>
<b>Rye. — Thousand centals (1 cental = 100 lbs)</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	42	15	463	57	2,004	1,195	2,663	463	1,213	690
Bulgaria . . . . .	33	62	0	0	915	669	0	0	1,413	0
Hungary . . . . .	35	110	0	0	842	1,177	0	0	1,579	0
Lithuania . . . . .	423	388	0	0	1,570	4,667	123	0	163	0
Poland . . . . .	—	—	—	—	(1) 1,431 (1)	701 (1)	0 (1)	0	5,880	2
Rumania . . . . .	—	—	—	—	(2) 4,409 (2)	2,132	—	—	1,299	0
U. S. S. R. . . . .	170	29	0	0	1,799	650	0	0	15,794	—
Canada . . . . .	2	11	—	—	33	57	—	—	1,171	0
United States . . . . .	906	73	—	—	1,830	800	—	—	90	—
Argentina . . . . .	66	24	0	0	410	262	0	0	992	—
Turkey . . . . .	—	—	—	—	(3) 9 (3)	24 (3)	0 (3)	0	368	0
Algeria . . . . .	0	0	49	214	0	9	869	1,045	85	0
<i>Importing Countries:</i>										
Austria . . . . .	20	40	168	258	287	57	1,418	1,613	9	2,205
Belgium . . . . .	0	0	110	214	0	0	2,963	4,587	120	3,788
Denmark . . . . .	0	0	0	29	0	0	7	82	4	7,103
Estonia . . . . .	0	0	13	2	0	0	328	1,213	0	154
Finland . . . . .	0	0	148	139	0	0	1,034	653	2	1,370
France . . . . .	0	0	13	24	0	0	77	359	0	1,973
Italy . . . . .	0	0	9	40	0	0	66	194	0	581
Latvia . . . . .	0	35	0	0	0	98	2	0	0	260
Norway . . . . .	0	0	324	335	0	0	2,399	1,978	0	3,023
Netherlands . . . . .	18	55	355	564	262	198	2,707	3,799	791	6,136
Sweden . . . . .	—	—	—	—	(1) 0 (1)	0 (1)	620 (1)	392	4	520
Switzerland . . . . .	0	0	7	11	0	0	53	119	0	174
Czechoslovakia . . . . .	0	87	271	4	4	437	4,169	115	476	844
<b>Totals . . . . .</b>	<b>1,715</b>	<b>939</b>	<b>1,930</b>	<b>1,891</b>	<b>15,805</b>	<b>12,567</b>	<b>19,498</b>	<b>16,567</b>	<b>31,409</b>	<b>23,435</b>

(1) (2) (3) See notes page 481.

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-End February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat flour. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	4	2	26	20	46	115	128	137	123	238
Belgium	4	15	2	18	40	112	40	152	216	231
Bulgaria	44	0	0	0	401	70	0	0	220	0
Spain	0	11	0	0	13	44	0	0	75	0
France	348	586	20	29	3,869	3,684	154	386	7,350	569
Hungary	62	152	0	0	1,532	2,970	0	0	4,008	0
Italy	216	121	24	13	1,470	794	190	101	1,179	225
Latvia	0	4	0	0	0	62	0	2	73	2
Lithuania	2	2	0	0	18	13	0	0	24	0
Poland	44	57	0	2	403	430	4	13	615	24
Rumania	...	...	...	(x)	478 (x)	271 (x)	0 (x)	0	421	0
Yugoslavia	2	4	0	0	55	75	0	2	88	2
Canada	661	814	2	4	6,538	8,556	24	31	13,115	49
United States	1,396	1,495	0	0	10,706	15,139	0	2	23,104	2
Argentina	95	141	—	—	752	1,197	—	—	2,044	—
Chile	4	4	0	0	11	90	0	0	104	0
India	73	62	0	0	536	617	0	2	1,032	2
Turkey	0	2	0	0	0	29	4	9	29	11
Japan	...	...	...	(x)	1,144 (x)	1,687 (x)	66 (x)	154	3,472	212
Algeria	...	...	...	(x)	44 (x)	185 (x)	37 (x)	18	267	57
Tunis	9	24	2	2	71	154	15	0	251	11
Australia	1,179	898	0	0	8,675	5,745	0	0	10,404	0
<i>Importing Countries:</i>										
Austria	0	0	71	216	7	4	670	1,433	13	3,100
Denmark	2	2	110	112	7	15	873	1,012	24	1,572
Estonia	0	0	0	9	9	0	13	68	2	88
Irish Free State	...	...	...	(x)	18 (x)	24 (x)	1,940 (x)	1,861	40	3,686
Finland	0	0	68	77	0	0	1,071	1,444	0	2,150
Gr. Britain and N. Ir.	417	328	955	825	3,038	2,723	6,945	7,690	4,008	12,816
Greece	0	0	2	4	0	0	51	104	0	165
Norway	0	0	157	73	7	2	981	772	2	1,369
Netherlands	15	7	42	251	55	73	483	2,335	115	3,545
Portugal	—	—	9	33	—	—	95	108	—	218
Sweden	...	...	...	(x)	0 (x)	2 (x)	22 (x)	49	2	71
Czechoslovakia	0	2	90	11	7	9	653	2,383	11	2,432
Ceylon	—	—	40	29	—	—	282	282	—	445
Java and Madura	—	—	...	...	—	—	(x)	626 (x)	459	1,025
Indo-China	—	—	35	40	—	—	238	244	—	428
Syria and Lebanon	4	0	33	0	82	4	187	101	22	168
Egypt	...	...	...	(x)	0 (x)	0 (x)	1,477 (x)	2,059	0	3,560
Union of South Africa	...	...	...	(x)	2 (x)	7 (x)	11 (x)	181	11	265
New Zealand	...	...	...	(x)	2 (x)	0 (x)	93 (x)	90	2	234
<b>Totals</b>	<b>4,581</b>	<b>4,738</b>	<b>1,689</b>	<b>1,775</b>	<b>39,353</b>	<b>44,917</b>	<b>17,373</b>	<b>23,733</b>	<b>73,129</b>	<b>39,299</b>
<b>Barley. — Thousand centals (1 cental = 100 lb.).</b>										
<i>Exporting Countries:</i>										
Bulgaria	0	84	0	0	395	1,109	0	0	1,598	0
Spain	0	15	0	0	4	126	0	0	152	0
Hungary	0	57	0	0	46	525	0	0	580	4
Lithuania	0	2	0	0	0	11	0	0	15	0
Poland	273	214	0	0	2,599	2,852	0	0	2,798	0
Rumania	...	...	...	(x)	13,596 (x)	25,682 (x)	0 (x)	0	33,797	4
Czechoslovakia	57	101	0	0	979	2,862	2	2	3,002	4
U. S. S. R.	...	...	...	(2)	7,055 (2)	5,249	—	—	23,535	—
Canada	154	57	0	0	3,915	1,393	—	0	9,240	0
United States	46	412	—	—	1,435	3,274	—	—	5,022	—
Argentina	1,737	657	—	—	3,702	2,789	—	—	5,701	—
Chile	97	49	0	0	203	317	0	0	536	0
India	7	0	0	0	229	317	0	0	306	2
Syria and Lebanon	2	60	24	0	363	414	71	4	869	7
Turkey	298	51	0	0	2,242	218	0	0	593	0
Algeria	...	...	...	(3)	481 (3)	1,041 (3)	1,777 (3)	4	1,444	465
Egypt	...	...	...	(x)	0 (x)	2 (x)	286 (x)	46	2	152
Tunis	2	4	40	35	123	161	527	243	220	390
Australia	456	278	0	0	1,129	959	0	0	1,552	0
<i>Importing Countries:</i>										
Germany	0	0	1,219	851	13	62	8,128	10,340	62	17,906
Austria	0	0	134	201	0	0	1,479	1,281	0	2,077
Belgium	163	146	805	1,005	1,001	353	6,682	6,706	1,076	10,638
Denmark	57	258	51	866	406	1,012	2,163	10,018	1,282	15,007
Estonia	0	0	0	0	0	0	0	13	0	13
Irish Free State	...	...	...	(x)	22 (x)	20 (x)	231 (x)	20	20	454
France	2	2	733	646	11	15	6,089	4,277	22	7,721
Gr. Britain and N. Ir.	0	0	511	794	9	20	10,820	13,444	68	13,691
Greece	0	0	29	7	0	0	46	68	0	79
Italy	0	0	60	75	0	0	450	496	0	773
Latvia	0	0	0	26	0	0	4	168	0	212
Norway	0	0	99	62	0	0	580	712	0	1,078
Netherlands	37	108	677	915	176	309	6,186	9,589	591	14,716
Switzerland	0	0	139	291	0	0	1,964	1,832	0	2,829
Yugoslavia	0	0	0	9	13	11	33	128	20	180
<b>Totals</b>	<b>3,393</b>	<b>2,557</b>	<b>4,871</b>	<b>5,783</b>	<b>40,152</b>	<b>50,288</b>	<b>47,468</b>	<b>59,331</b>	<b>93,912</b>	<b>93,257</b>

(1) (2) (3) See notes page 284.

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-End February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Oats. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	0	2	2	115	7	209	176	300	220	1,005
Irish Free State	...	...	...	...	(1)	49 (1)	181 (1)	152 (1)	123	254
Hungary	0	0	0	4	4	11	2	33	13	141
Lithuania	4	11	0	0	9	71	0	0	84	0
Poland	4	7	0	0	22	95	0	0	137	0
Rumania	...	...	...	...	(1)	269 (1)	1,252 (1)	0 (1)	0	1,779
Czechoslovakia	51	18	2	2	351	694	55	7	710	143
U. S. S. R.	...	...	...	...	...	...	...	...	10,726	...
Yugoslavia	0	0	0	2	0	0	0	75	2	86
Canada	388	44	0	0	2,533	734	536	229	2,659	234
United States	4	4	2	4	639	86	9	115	130	198
Argentina	3,306	1,911	...	...	8,375	7,638	...	...	14,821	...
Chile	7	57	0	0	119	1,001	0	0	2,178	0
Algeria	...	...	...	...	(3)	84 (3)	642 (3)	276 (3)	1,292	225
Tunis	7	26	0	0	132	386	0	9	545	9
Australia	20	9	0	0	53	51	0	0	73	2
<i>Importing Countries:</i>										
Austria	0	0	108	203	0	2	844	1,109	2	2,227
Belgium	4	0	128	340	7	2	646	2,251	4	3,494
Denmark	13	11	0	101	57	18	258	534	20	1,270
Estonia	0	0	0	13	0	0	7	42	0	159
Finland	4	2	0	0	18	4	40	60	7	280
France	0	0	143	128	4	11	798	1,138	20	2,213
Gr. Brit. and N. Irel.	68	35	573	492	106	73	4,093	5,993	397	10,697
Italy	0	0	240	267	0	0	2,000	2,540	0	3,741
Latvia	0	0	0	4	0	4	7	18	4	57
Norway	0	0	73	0	0	0	203	0	4	4
Netherlands	7	00	265	174	35	132	1,332	1,920	375	3,609
Sweden	...	...	...	...	(1)	7 (1)	15 (1)	659 (1)	493	1,334
Switzerland	0	0	278	386	0	0	2,626	2,802	2	4,564
<b>Totals</b>	<b>2,867</b>	<b>2,336</b>	<b>1,314</b>	<b>2,235</b>	<b>12,880</b>	<b>13,302</b>	<b>15,229</b>	<b>19,838</b>	<b>36,298</b>	<b>36,124</b>

**Maize. — Thousand cents (1 cental = 100 lbs).**

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-End February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Maize. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria	351	95	0	0	1,060	1,135	0	0	3,477	0
Rumania	...	...	...	...	(1)	11,248 (1)	5,150 (1)	0 (1)	0	18,700
Yugoslavia	105	002	2	0	886	3,139	20	7	6,420	24
United States	143	218	15	37	498	375	97	342	1,336	520
Argentina	9,689	9,700	...	...	62,025	45,515	...	...	198,617	...
Brazil	...	...	...	...	(3)	0 (3)	...	...	18	...
Java and Madura	...	...	...	...	(1)	862 (1)	90	...	2,407	...
Indo-China	20	20	...	...	1,257	1,523	...	...	2,584	...
Syria and Lebanon	0	26	0	4	7	77	7	9	159	49
Turkey	24	7	0	0	62	9	0	0	212	0
Egypt	...	...	...	...	(1)	2 (1)	2 (1)	13 (1)	18	298
Union of South Africa	...	...	...	...	(3)	1,241 (3)	972 (3)	0 (3)	3,298	0
<i>Importing Countries:</i>										
Germany	0	0	1,587	617	0	0	4,799	2,403	0	10,007
Austria	0	0	620	412	0	0	2,705	1,614	2	6,270
Belgium	185	93	1,477	1,107	317	201	7,573	4,764	955	17,075
Denmark	0	0	1,830	644	0	0	7,813	2,793	0	13,539
Spain	0	0	1,283	527	0	0	2,306	1,285	0	3,666
Irish Free State	...	...	...	...	(1)	0 (1)	0 (1)	3,300 (1)	2,094	12,044
Finland	0	0	35	13	0	0	143	64	0	355
France	2	4	2,284	1,475	7	22	8,821	7,599	40	23,755
Gr. Brit. and N. Ir.	181	212	5,907	3,148	019	789	27,382	17,465	2,407	53,281
Greece	0	0	1,213	4	0	0	1,704	26	0	873
Hungary	2	15	84	88	46	176	214	243	240	2,337
Italy	0	0	1,380	362	2	2	4,451	4,727	7	17,447
Norway	0	0	176	209	0	0	1,585	1,014	0	3,977
Netherlands	11	26	3,047	1,709	51	141	16,145	10,576	273	32,441
Poland	0	0	0	7	0	0	51	82	0	496
Portugal	...	...	95	143	...	...	395	873	...	1,605
Sweden	...	...	...	...	(1)	0 (1)	0 (1)	1,931 (1)	1,362	7,311
Switzerland	0	0	284	238	0	0	1,453	1,154	2	3,611
Czechoslovakia	0	0	1,250	653	0	0	5,362	2,905	2	13,115
Canada	0	0	280	192	4	4	2,165	1,711	9	4,780
Japan	...	...	...	...	...	...	(1)	538 (1)	302	1,689
Tunis	0	0	35	37	0	0	203	145	9	298
<b>Totals</b>	<b>10,762</b>	<b>11,117</b>	<b>22,293</b>	<b>12,126</b>	<b>79,994</b>	<b>59,331</b>	<b>101,266</b>	<b>65,613</b>	<b>241,204</b>	<b>230,345</b>

(1) (3) See notes page 284.

COUNTRIES	FEBRUARY				TWO MONTHS (January 1-End February)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1932	1931	1932	1931	1931	1931
<b>Rice. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Spain . . . . .	90	55	0	0	148	88	0	0	833	0
Italy . . . . .	417	370	0	0	831	783	7	2	3,109	53
United States . . . . .	203	260	15	40	353	635	40	84	2,771	328
Brazil . . . . .	—	—	—	—	—	—	—	—	1,003	—
India . . . . .	5,454	3,331	2	2	9,297	6,690	35	11	48,575	692
Indo-China . . . . .	1,043	1,265	—	—	2,879	2,427	—	—	21,153	—
Siam . . . . .	—	—	—	—	(1) 2,080	(1) 2,163	—	—	24,758	—
Egypt . . . . .	—	—	—	—	(1) 22	(1) 119	(1) 11	(1) 4	686	836
<i>Importing Countries:</i>										
Germany . . . . .	77	53	602	230	161	112	1,021	454	1,373	8,962
Austria . . . . .	0	0	44	46	0	0	82	101	0	756
Belgium . . . . .	33	13	49	57	53	26	130	95	190	1,349
Denmark . . . . .	0	0	9	13	0	0	15	26	0	157
Estonia . . . . .	—	—	0	2	—	—	2	4	—	23
Irish Free State . . . . .	—	—	—	—	(1) 0	(1) 0	(1) 4	(1) 4	—	58
France . . . . .	79	62	450	317	141	134	893	608	937	6,792
Gr. Brit. and N. Irel. . . . .	15	18	238	132	35	31	355	262	271	2,090
Greece . . . . .	—	—	53	35	—	—	93	84	—	540
Hungary . . . . .	0	0	29	22	0	0	68	53	2	481
Latvia . . . . .	0	0	0	9	0	0	2	24	0	82
Lithuania . . . . .	0	0	2	4	0	0	2	4	0	22
Norway . . . . .	0	0	2	4	0	0	9	15	0	117
Netherlands . . . . .	170	146	57	60	282	278	110	306	2,480	4,963
Poland . . . . .	29	9	15	2	55	18	18	2	606	1,726
Portugal . . . . .	—	—	60	35	—	—	95	57	—	613
Sweden . . . . .	—	—	—	—	—	(1) 0	(1) 0	—	—	123
Switzerland . . . . .	0	0	24	26	0	0	84	71	0	454
Czechoslovakia . . . . .	0	0	49	40	0	0	146	84	0	1,127
Yugoslavia . . . . .	0	0	64	37	0	2	121	77	4	511
Canada . . . . .	0	0	26	66	—	0	60	137	0	710
Chile . . . . .	—	—	22	33	—	—	51	84	—	441
Ceylon . . . . .	0	0	1,109	913	0	2	2,119	1,865	18	10,196
Java and Madura . . . . .	—	—	—	—	(1) 2	(1) 13	(1) 351	(1) 617	232	5,386
Japan . . . . .	—	—	—	—	(1) 4	(1) 320	(1) 236	(1) 101	4,195	2,778
Syria and Lebanon . . . . .	0	0	22	22	0	0	55	44	0	322
Turkey . . . . .	0	0	4	13	0	0	9	26	0	183
Algeria . . . . .	—	—	—	—	—	—	—	—	(4) 2	(4) 134
Tunis . . . . .	0	0	11	2	0	0	15	4	0	31
Union of S. Africa . . . . .	—	—	—	—	—	—	—	—	0	1,025
Australia . . . . .	9	9	2	4	22	18	7	0	101	29
New Zealand . . . . .	—	—	—	—	—	—	—	—	0	73
Totals . . . . .	7,619	5,591	2,966	2,156	16,315	13,829	6,381	5,379	114,349	55,263

<b>Linseed. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Estonia . . . . .	0	0	0	0	0	2	0	0	4	0
Lithuania . . . . .	31	20	0	0	60	79	0	0	247	0
Argentina . . . . .	4,334	5,148	—	—	8,962	10,155	—	—	41,340	—
India . . . . .	137	58	0	0	328	161	0	0	2,515	0
Tunis . . . . .	2	0	0	0	2	0	0	0	4	0
<i>Importing Countries:</i>										
Germany . . . . .	2	0	470	578	4	2	939	1,078	13	7,507
Belgium . . . . .	9	7	340	348	73	11	622	608	205	8,702
Denmark . . . . .	—	—	18	40	—	—	51	68	—	417
Spain . . . . .	—	—	20	31	—	—	35	62	—	465
Finland . . . . .	0	0	7	0	0	0	7	11	0	68
France . . . . .	0	0	278	320	2	2	536	534	18	5,814
Gr. Brit. and N. Irel. . . . .	0	0	877	642	0	0	1,248	1,098	4	7,599
Greece . . . . .	0	0	2	11	0	0	4	15	0	95
Hungary . . . . .	0	0	0	0	0	0	0	2	42	2
Italy . . . . .	0	0	121	84	0	0	216	161	0	1,351
Latvia . . . . .	4	7	2	9	15	33	4	13	106	90
Norway . . . . .	0	0	22	33	0	0	40	66	0	289
Netherlands . . . . .	9	4	529	573	55	9	1,543	1,043	49	9,253
Poland . . . . .	0	0	11	7	2	2	18	11	7	273
Sweden . . . . .	—	—	—	—	—	(1) 33	(1) 33	—	—	1,056
Czechoslovakia . . . . .	0	0	29	9	0	2	60	24	7	582
Yugoslavia . . . . .	0	0	0	7	0	0	0	11	0	126
Canada . . . . .	0	2	0	0	0	2	0	0	584	194
United States . . . . .	—	—	617	584	—	—	1,021	730	—	8,169
Japan . . . . .	—	—	—	—	—	(1) 33	(1) 33	—	—	186
Australia . . . . .	0	0	157	126	0	0	181	139	0	291
Totals . . . . .	4,538	5,241	3,500	3,352	9,503	10,460	6,591	5,697	45,151	47,468

(1) (4) See notes page 284.

COUNTRIES	FEBRUARY				TWO MONTHS (January 1-End February)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1932	1931	1932	1931	1931	1931

<b>Butter. — (Thousand lbs.).</b>										
<i>Exporting Countries:</i>										
Austria . . . . .	84	401	22	2	183	851	24	4	2,862	1,565
Denmark . . . . .	26,156	26,883	128	55	55,263	57,955	320	64	373,429	1,596
Estonia . . . . .	994	1,052	0	0	2,182	2,500	0	0	31,844	0
Irish Free State . . . . .	...	...	...	(x)	212 (x)	364 (x)	203 (x)	439	42,807	3,325
Finland . . . . .	3,080	3,084	0	0	6,816	6,852	0	0	38,367	0
France . . . . .	498	935	2,546	7,300	1,321	1,695	2,646	10,285	11,036	40,836
Hungary . . . . .	450	121	0	0	877	406	0	0	4,065	117
Latvia . . . . .	1,587	1,711	0	2	4,103	4,090	0	4	41,313	24
Lithuania . . . . .	496	588	0	0	970	1,206	0	0	19,191	0
Netherlands . . . . .	1,881	4,010	3,541	573	4,220	9,030	6,301	1,506	72,660	8,887
Poland . . . . .	249	1,717	0	0	1,157	3,393	0	2	27,470	31
Sweden . . . . .	...	...	...	(x)	3,210 (x)	4,451 (x)	7 (x)	0	48,162	40
U. S. S. R. . . . .	...	...	...	...	...	...	...	(5)	18,052	—
Argentina . . . . .	6,001	7,183	—	—	13,827	15,223	—	—	47,915	—
India . . . . .	18	35	33	18	53	93	86	46	264	344
Syria and Lebanon . . . . .	15	97	148	9	79	377	249	13	1,817	344
Australia . . . . .	18,074	16,255	0	0	48,714	35,567	0	0	208,924	0
New Zealand . . . . .	33,786	20,712	—	—	48,348	46,635	—	—	220,514	—
<i>Importing Countries:</i>										
Germany . . . . .	11	26	12,672	17,101	15	49	31,623	34,214	269	220,950
Belgium . . . . .	180	194	6,969	3,181	198	362	12,361	6,995	2,756	41,662
Spain . . . . .	13	9	9	4	15	18	11	7	88	121
Gr. Brit. and N. Irel. . . . .	8,748	7,143	81,527	66,880	17,269	11,319	161,180	142,523	40,228	903,967
Greece . . . . .	—	—	146	104	—	—	214	214	—	2,059
Italy . . . . .	60	84	1,045	721	90	132	1,949	1,486	1,290	6,188
Norway . . . . .	395	198	2	18	831	287	7	44	1,629	379
Switzerland . . . . .	0	2	1,327	1,887	0	2	2,456	3,413	20	23,353
Czechoslovakia . . . . .	0	150	24	2	24	280	68	18	661	4,107
Canada . . . . .	140	42	44	470	258	108	62	917	10,631	2,322
United States . . . . .	108	141	139	97	251	366	262	207	2,004	1,853
Ceylon . . . . .	—	—	53	46	—	—	108	106	—	942
Java and Madura . . . . .	—	—	...	...	—	—	(x)	525 (x)	787	8,514
Japan . . . . .	—	—	...	...	—	—	(x)	20 (x)	40	231
Algeria . . . . .	...	...	...	...	...	...	...	(4)	86 (4)	4,237
Egypt . . . . .	...	...	...	...	77 (x)	0 (x)	99 (x)	287	77	2,041
Tunis . . . . .	0	0	99	66	0	0	192	148	0	930
<b>Totals . . . . .</b>	<b>102,989</b>	<b>92,771</b>	<b>110,474</b>	<b>98,486</b>	<b>210,013</b>	<b>203,111</b>	<b>221,041</b>	<b>203,769</b>	<b>1,270,370</b>	<b>1,281,100</b>

<b>Cheese. — (Thousand lbs.).</b>										
<i>Exporting Countries:</i>										
Denmark . . . . .	950	655	11	53	1,894	1,398	42	117	9,423	604
Finland . . . . .	608	405	2	4	1,197	1,087	2	9	5,776	93
Italy . . . . .	6,393	6,579	608	703	10,452	11,333	1,082	1,290	89,045	10,115
Lithuania . . . . .	108	143	0	0	381	333	0	0	2,546	11
Norway . . . . .	351	187	26	44	670	304	46	89	2,840	562
Netherlands . . . . .	12,031	12,886	97	90	25,001	27,747	179	201	190,490	1,845
Poland . . . . .	128	203	49	53	346	514	79	112	2,584	761
Switzerland . . . . .	3,260	4,557	379	483	6,360	9,015	970	935	54,307	8,470
Czechoslovakia . . . . .	697	752	132	218	1,867	1,698	351	381	10,981	3,779
Yugoslavia . . . . .	134	201	20	22	408	229	33	37	4,198	243
Canada . . . . .	668	306	84	98	1,420	1,224	152	174	84,790	1,446
Australia . . . . .	836	983	2	4	2,209	1,508	2	7	7,405	24
New Zealand . . . . .	18,451	23,852	0	0	41,967	44,348	0	0	181,708	4
<i>Importing Countries:</i>										
Germany . . . . .	414	578	7,621	8,611	661	1,087	15,260	18,036	7,372	120,404
Austria . . . . .	9	373	337	392	75	798	604	705	6,213	5,192
Belgium . . . . .	51	60	3,278	3,322	99	119	6,978	7,637	514	49,800
Spain . . . . .	13	15	165	401	20	29	569	569	233	3,897
Irish Free State . . . . .	...	...	...	(x)	20 (x)	13 (x)	172 (x)	262	194	2,687
France . . . . .	2,612	3,772	5,415	5,985	5,529	6,398	7,551	11,427	33,259	82,810
Gr. Brit. and N. Irel. . . . .	677	611	26,224	31,481	1,259	1,288	53,434	57,567	7,346	323,031
Greece . . . . .	0	15	315	231	0	20	642	428	190	3,960
Hungary . . . . .	4	7	2	20	9	20	9	57	110	208
Portugal . . . . .	—	—	31	22	—	—	44	49	—	342
Sweden . . . . .	—	—	...	...	—	—	(x)	64 (x)	77	1,691
United States . . . . .	98	121	3,580	4,061	271	317	7,311	8,184	1,865	61,992
India . . . . .	0	0	62	79	0	0	141	212	7	—
Java and Madura . . . . .	—	—	...	...	—	—	(x)	98 (x)	106	1,658
Syria and Lebanon . . . . .	0	0	88	60	2	0	179	121	86	708
Algeria . . . . .	...	...	...	...	...	...	...	...	196	11,182
Egypt . . . . .	...	...	...	(x)	37 (x)	11 (x)	281 (x)	686	78	7,835
Tunis . . . . .	0	0	174	130	0	2	357	326	24	2,033
<b>Totals . . . . .</b>	<b>48,537</b>	<b>57,416</b>	<b>48,762</b>	<b>56,462</b>	<b>102,154</b>	<b>110,890</b>	<b>96,312</b>	<b>103,787</b>	<b>794,343</b>	<b>768,138</b>

(x) (4) (5) See notes page 284.

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-End February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Cotton. — Thousand cents (1 cental = 100 lbs.).</b>										
<i>Exporting Countries:</i>										
United States . . . . .	5,201	2,317	46	55	31,758	26,431	240	207	36,301	538
Argentina . . . . .	7	2	—	—	253	223	—	—	511	—
Brazil . . . . .	—	—	—	—	(3) 174	(3) 231	—	—	516	—
India . . . . .	650	1,733	159	150	4,603	8,800	582	767	14,881	1,376
Egypt . . . . .	—	—	—	—	(1) 4,198	(1) 3,408	(1) 0	(1) 0	6,069	0
<i>Importing Countries:</i>										
Germany . . . . .	101	110	701	562	1,052	1,025	4,921	5,470	1,706	8,442
Austria . . . . .	0	0	49	42	0	0	346	289	0	467
Belgium . . . . .	31	22	108	157	223	93	933	911	201	1,713
Denmark . . . . .	—	—	11	9	—	—	77	79	—	150
Spain . . . . .	2	4	276	317	13	15	1,177	1,288	24	2,253
Estonia . . . . .	0	0	4	11	0	0	42	55	0	84
Finland . . . . .	0	0	15	15	0	0	95	112	0	172
France . . . . .	40	40	309	844	344	328	2,026	5,626	549	8,131
Gr. Brit. and N. Irel. . . . .	46	22	880	734	243	282	7,388	7,255	481	10,959
Greece . . . . .	0	0	15	15	0	0	126	119	0	225
Hungary . . . . .	0	0	37	22	0	0	201	170	—	391
Italy . . . . .	0	0	481	384	0	2	2,310	2,242	2	3,821
Latvia . . . . .	0	0	2	0	0	0	35	41	0	62
Norway . . . . .	0	0	2	0	0	0	26	35	0	46
Netherlands . . . . .	0	0	90	82	7	4	584	608	7	1,043
Poland . . . . .	2	2	62	84	15	13	633	875	24	1,444
Portugal . . . . .	—	—	35	35	—	—	225	209	—	333
Sweden . . . . .	—	—	—	—	—	—	(1) 302	(1) 249	—	467
Switzerland . . . . .	0	0	42	46	4	0	317	410	7	608
Czechoslovakia . . . . .	11	9	143	181	86	95	1,232	1,459	154	2,368
Yugoslavia . . . . .	0	0	20	11	0	0	128	108	0	185
Canada . . . . .	—	—	73	55	—	—	595	608	—	1,025
Japan . . . . .	—	—	—	—	(1) 392	(1) 276	(1) 5,853	(1) 5,404	534	13,741
Algeria . . . . .	—	—	—	—	(3) 0	(3) 2	(3) 2	(3) 0	24	4
<b>Totals . . . . .</b>	<b>6,091</b>	<b>4,261</b>	<b>3,560</b>	<b>3,917</b>	<b>43,370</b>	<b>41,297</b>	<b>30,396</b>	<b>34,689</b>	<b>62,681</b>	<b>60,448</b>

**Wool. — (Thousand lbs.).**

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-End February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wool. — (Thousand lbs.).</b>										
<i>Exporting Countries:</i>										
Spain . . . . .	170	86	505	1,098	1,435	2,586	1,750	3,007	3,946	10,474
Irish Free State . . . . .	—	—	—	—	(1) 5,633	(1) 2,566	(1) 375	(1) 271	7,905	752
Hungary . . . . .	4	82	90	106	1,106	1,334	763	1,032	6,981	1,612
Argentina . . . . .	60,504	40,226	—	—	149,723	138,627	—	—	287,424	—
Chile . . . . .	12,033	3,479	—	—	15,313	11,526	—	—	4,266	—
India . . . . .	2,183	2,273	315	146	21,010	15,036	2,059	719	41,806	4,857
Syria and Lebanon . . . . .	183	128	9	4	2,289	4,266	421	1,645	9,315	3,944
Algeria . . . . .	—	—	—	—	(4) 1,942	(4) 8,054	(4) 403	(4) 278	10,835	1,371
Egypt . . . . .	—	—	—	—	(3) 796	(3) 935	(3) 0	(3) 0	3,752	2
Un. of S. Africa . . . . .	—	—	—	—	(3) 82,480	(3) 120,192	(3) 0	(3) 33	289,750	38
Australia . . . . .	82,473	88,225	500	104	(3) 1,479	(3) 1,204	(3) 545	(3) 430	4,330	500
New Zealand . . . . .	3,472	4,187	0	0	517,127	500,570	1,162	578	740,742	2,337
—	36,145	19,119	0	0	30,886	21,142	7	37	43,023	53
—	4,469	1,825	0	0	84,413	64,850	2	2	172,882	0
—	—	—	—	—	19,482	13,018	2	0	44,675	0
<i>Importing Countries:</i>										
Germany . . . . .	340	977	35,217	49,765	8,578	4,215	98,499	150,032	11,905	829,621
Austria . . . . .	703	1,243	3,884	2,355	6,100	5,913	15,902	13,984	13,153	30,552
Belgium . . . . .	0	7	1,473	811	49	159	4,844	6,539	254	14,234
Denmark . . . . .	—	—	—	—	(3) 4,484	(3) 4,405	(3) 26,416	(3) 31,880	10,511	183,435
Finland . . . . .	18	13	421	320	(3) 8,278	(3) 7,282	(3) 1,189	(3) 1,398	21,638	3,818
France . . . . .	4	0	209	196	108	29	2,348	1,850	93	8,591
Gr. Britain and N. Ir. . . . .	2,906	3,788	37,324	78,943	79	20	2,179	1,204	84	2,828
Greece . . . . .	30,060	26,072	88,580	82,244	26,361	25,214	162,120	236,367	51,506	480,906
Italy . . . . .	7	0	240	152	131,833	134,172	396,364	355,699	309,823	821,498
Norway . . . . .	126	130	20,014	14,273	62	187	1,367	1,316	392	3,025
Netherlands . . . . .	95	157	1,418	476	853	911	62,149	51,174	2,161	96,686
Poland . . . . .	40	13	238	112	1,065	1,032	8,541	4,856	4,967	9,509
Sweden . . . . .	143	146	1,138	1,118	423	317	1,213	860	725	1,596
Switzerland . . . . .	9	13	637	791	1,146	952	3,594	4,960	2,394	8,770
Czechoslovakia . . . . .	99	225	2,320	3,512	315	150	3,770	3,415	383	7,134
Yugoslavia . . . . .	—	—	—	—	1,168	1,210	12,418	16,687	2,610	36,253
Canada . . . . .	31	84	1,479	1,470	—	—	(1) 7,540	(1) 5,675	—	15,461
United States . . . . .	29	99	1,199	3,098	328	110	8,717	9,727	366	18,362
Japan . . . . .	11	0	322	1,025	1,389	679	16,713	15,038	1,590	36,352
Tunis . . . . .	93	60	514	1,010	84	22	1,638	4,323	24	7,968
Totals . . . . .	236,482	193,039	208,242	254,931	1,131,850	1,096,489	976,321	1,088,694	2,134,748	2,403,714

a) = Wool, greasy; b) = Wool, scoured.

(1) (3) (4) See notes page 284.

COUNTRIES	FEBRUARY		EIGHT MONTHS (July 1-End Feb.)		TWELVE MONTHS (July 1-June 30)	COUNTRIES	FEBRUARY		EIGHT MONTHS (July 1-End Feb.)		TWELVE MONTHS (July 1-June 30)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Coffee. (Thousand lbs.).</b>						<b>Tea. (Thousand lbs.).</b>					
<b>EXPORTS.</b>						<b>EXPORTS.</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Brazil . . . . .	...	...	1,312,196	1,389,048	2,317,280	Ceylon . . . . .	17,816	18,991	144,806	150,078	247,397
India . . . . .	4,718	3,261	7,853	10,066	28,490	India . . . . .	15,360	16,925	304,160	310,061	347,401
Java and Madura . . . . .	...	...	(r) 31,604	(r) 28,940	38,105	Java and Madura . . . . .	...	...	(r) 94,554	(r) 88,500	158,936
						Japan . . . . .	...	...	(r) 16,967	(r) 15,895	24,315
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	55	117	1,345	893	1,345	Belgium . . . . .	4	2	18	22	31
Belgium . . . . .	1,896	485	8,289	2,154	5,090	Irish Free State . . . . .	...	...	(r) 148	(r) 95	185
France . . . . .	0	0	11	57	60	France . . . . .	2	4	51	26	35
Netherlands . . . . .	180,614	1,501	9,965	13,126	19,059	Gr. Brit. and N. Ir. . . . .	5,844	6,034	59,567	57,446	87,062
Portugal . . . . .	86	46	690	386	553	Netherlands . . . . .	30	7	97	71	115
Switzerland . . . . .	64	31	481	218	399	United States . . . . .	33	26	342	340	470
Canada . . . . .	2	2	29	40	55	Syria and Lebanon . . . . .	0	0	4	11	18
United States . . . . .	1,316	1,775	10,754	15,708	24,236	Algeria . . . . .	...	...	(3) 26	(3) 11	22
Ceylon . . . . .	2	0	9	223	227	Union of S. Africa . . . . .	...	...	(3) 22	(3) 35	66
Syria and Lebanon . . . . .	2	0	7	42	62	Australia . . . . .	85	71	403	653	851
Australia . . . . .	4	9	37	40	53	New Zealand . . . . .	...	...	(3) 87	(3) 64	115
<b>Totals . . . . .</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,430,651</b>	<b>Totals . . . . .</b>	<b>39,114</b>	<b>42,060</b>	<b>631,262</b>	<b>623,306</b>	<b>867,015</b>
<b>IMPORTS.</b>						<b>IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	31,475	31,143	219,010	238,140	350,362	Germany . . . . .	948	349	7,319	9,059	12,741
Austria . . . . .	1,563	1,773	10,728	13,911	23,268	Austria . . . . .	84	115	805	926	1,409
Belgium . . . . .	14,806	10,309	94,404	74,845	123,457	Belgium . . . . .	101	64	443	421	639
Bulgaria . . . . .	183	174	985	1,071	1,660	Denmark . . . . .	110	143	893	847	1,296
Denmark . . . . .	7,059	4,758	45,380	39,372	63,220	Spain . . . . .	37	11	203	194	232
Spain . . . . .	5,989	4,180	33,334	50,468	68,795	Estonia . . . . .	11	9	115	99	146
Estonia . . . . .	26	24	185	216	309	Irish Free State . . . . .	...	...	(r) 15,307	(r) 14,947	24,346
Irish Free State . . . . .	...	...	(r) 281	(r) 231	625	Finland . . . . .	20	24	194	172	260
Finland . . . . .	1,790	937	22,529	29,884	40,442	France . . . . .	300	357	2,253	2,207	3,556
France . . . . .	32,284	36,734	275,775	264,306	406,168	Gr. Britain and N. . . . .	43,094	33,570	426,132	425,039	541,616
Gr. Britain and N. . . . .	...	...	...	...	...	Ireland . . . . .	...	...	...	...	...
Ireland . . . . .	3,018	2,908	24,507	24,302	37,858	Greece . . . . .	49	46	478	503	844
Greece . . . . .	888	1,033	9,515	8,508	12,959	Hungary . . . . .	29	42	461	505	660
Hungary . . . . .	448	511	4,151	4,850	7,568	Italy . . . . .	24	29	218	212	326
Italy . . . . .	7,410	7,467	62,137	64,651	98,430	Latvia . . . . .	7	11	104	119	168
Latvia . . . . .	49	24	313	251	351	Lithuania . . . . .	4	26	84	126	179
Lithuania . . . . .	7	37	403	337	478	Norway . . . . .	40	33	280	254	388
Norway . . . . .	2,491	2,912	25,133	23,640	37,890	Netherlands . . . . .	2,599	2,575	20,239	20,221	32,512
Netherlands . . . . .	8,944	7,531	73,591	68,553	100,438	Poland . . . . .	265	375	3,236	3,095	4,614
Poland . . . . .	595	1,219	13,608	11,424	17,589	Portugal . . . . .	62	42	428	392	597
Portugal . . . . .	1,230	1,305	7,813	7,486	11,413	Sweden . . . . .	...	...	(r) 551	(r) 516	928
Sweden . . . . .	...	...	(r) 79,226	(r) 57,422	100,829	Switzerland . . . . .	176	168	1,186	1,118	1,781
Switzerland . . . . .	2,083	2,714	21,940	18,298	31,608	Czechoslovakia . . . . .	93	110	1,369	1,124	1,473
Czechoslovakia . . . . .	2,848	2,736	21,343	18,411	29,026	Yugoslavia . . . . .	33	31	496	509	628
Yugoslavia . . . . .	1,484	1,312	11,925	13,861	20,862	Canada . . . . .	9,010	2,985	26,555	29,449	43,147
Canada . . . . .	2,989	2,815	10,467	19,698	33,689	United States . . . . .	6,593	5,223	65,378	61,894	87,151
United States . . . . .	151,934	170,159	1,081,483	1,070,513	1,728,578	Chile . . . . .	564	419	3,668	3,547	5,382
Chile . . . . .	536	747	6,402	5,970	10,516	Syria and Lebanon . . . . .	31	42	430	291	351
Ceylon . . . . .	582	256	3,274	2,540	3,145	Turkey . . . . .	0	179	950	1,475	2,185
Japan . . . . .	95	183	1,541	1,847	4,478	Algeria . . . . .	...	...	(3) 1,349	(3) 1,545	3,180
Syria and Lebanon . . . . .	...	...	(r) 2,967	(r) 2,509	2,732	Egypt . . . . .	...	...	(r) 8,417	(r) 8,773	13,616
Turkey . . . . .	384	1,133	5,882	8,521	12,653	Tunis . . . . .	216	73	5,756	2,041	2,982
Algeria . . . . .	...	...	(3) 14,511	(3) 14,890	39,527	Union of S. Africa . . . . .	...	...	(3) 7,897	(3) 6,557	13,296
Egypt . . . . .	...	...	(r) 8,909	(r) 7,002	14,557	Australia . . . . .	3,984	3,675	29,893	34,317	46,441
Tunis . . . . .	97	258	2,000	2,224	3,083	New Zealand . . . . .	...	...	(3) 5,415	(3) 5,496	14,406
Un. of S. Africa . . . . .	...	...	(3) 15,704	(3) 15,840	31,890						
Australia . . . . .	115	280	1,907	1,753	2,619						
New Zealand . . . . .	...	...	(3) 236	(3) 214	430						
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India . . . . .	0	547	60	3,358	4,090	India . . . . .	271	338	5,296	4,345	6,232
Java and Madura . . . . .	...	...	...	...	...	Java and Madura . . . . .	...	...	(r) 7,101	(r) 8,120	11,330
<b>Totals . . . . .</b>	<b>239,549</b>	<b>296,226</b>	<b>2,223,178</b>	<b>2,191,214</b>	<b>3,469,093</b>	<b>Totals . . . . .</b>	<b>68,555</b>	<b>55,950</b>	<b>650,914</b>	<b>648,535</b>	<b>881,182</b>

(r) (3) See notes page 284.

COUNTRIES	FEBRUARY		FIVE MONTHS (Oct. 1-End Feb.)		TWELVE MONTHS (Oct. 1- Sept. 30)	COUNTRIES	FEBRUARY		SEVEN MONTHS (August 1-End Feb.)		TWELVE MONTHS August 1- (July 31)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Cacao (Thousand lbs.).</b>						<b>Total Wheat and Flour (*)</b> (Thousand centals).					
<b>EXPORTS.</b>						<b>a) NET EXPORTS</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada . . . . .	864	1,158	3,027	3,618	9,905	Bulgaria . . . . .	763	9	4,805	941	3,527
Dominican Republ. . . . .	...	...	(x) 8,587 (x)	9,916	61,328	Spain . . . . .	0	15	(6)	64	104
Brazil . . . . .	...	...	(x) 81,430 (x)	62,991	146,469	Hungary . . . . .	181	443	8,638	7,961	10,501
Ecuador . . . . .	3,499	1,532	9,791	10,245	33,076	Lithuania . . . . .	9	108	33	377	667
Trinidad . . . . .	...	...	(x) 16,841 (x)	14,917	61,569	Poland . . . . .	214	187	633	1,713	2,586
Venezuela . . . . .	...	...	(x) 5,864 (x)	9,065	45,076	Rumania . . . . .	...	...	(x) 19,970 (x)	6,750	9,557
Ceylon . . . . .	1,261	913	5,426	4,612	8,360	U. S. S. R. . . . .	...	...	2(8)22,919 2(8)14,617 (8)	67,735	3,362
Java and Madura . . . . .	...	...	(x) 1,019 (x)	1,014	3,073	Yugoslavia . . . . .	181	7	6,914	2,857	3,362
Cameroon . . . . .	...	...	(x) 15,155 (x)	14,575	30,126	Canada . . . . .	6,817	7,249	76,979	100,485	154,480
Ivory Coast . . . . .	...	...	(x) 19,974 (x)	15,203	43,363	United States . . . . .	4,184	1,470	42,545	30,712	65,406
Gold Coast . . . . .	90,615	93,452	320,670	241,037	486,374	Argentina . . . . .	10,622	10,562	36,709	28,464	73,553
Nigeria . . . . .	...	...	(x) 54,486 (x)	59,825	116,385	Chile . . . . .	0	29	20	545	567
St. Thomas and Prince Is. . . . .	1,750	1,784	13,420	13,415	28,784	British India . . . . .	101	(6)	697	(6)	(6)
Togoland . . . . .	...	...	(x) 5,201 (x)	5,785	16,400	Syria and Lebanon . . . . .	(6)	(6)	269	(6)	(6)
						Turkey . . . . .	128	7	483	187	282
						Algeria . . . . .	...	...	(3) 988 (3)	4,706	4,614
<i>Importing Countries:</i>						Tunis . . . . .	18	(6)	1,308	1,214	3,481
Germany . . . . .	99	0	459	432	454	Australia . . . . .	12,551	10,002	49,183	40,704	90,379
Belgium . . . . .	24	60	357	220	309	<b>Totals . . . . .</b>	<b>35,778</b>	<b>30,688</b>	<b>272,683</b>	<b>251,356</b>	<b>490,889</b>
France . . . . .	0	148	2	223	223						
Netherlands . . . . .	187	1,281	3,721	3,617	10,679						
Czechoslovakia . . . . .	0	0	0	13	18						
United States . . . . .	604	1,045	3,508	3,657	8,521						
Australia . . . . .	0	0	119	37	86						
<b>Totals . . . . .</b>	<b>98,873</b>	<b>101,368</b>	<b>366,646</b>	<b>476,426</b>	<b>1,109,058</b>						
<b>IMPORTS.</b>						<b>b) NET IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	23,517	24,533	93,353	86,604	180,001	Germany . . . . .	1,448	988	3,422	10,368	18,680
Austria . . . . .	1,047	1,246	5,598	5,044	10,682	Austria . . . . .	414	696	4,956	4,381	9,345
Belgium . . . . .	2,310	2,086	9,866	9,614	25,532	Belgium . . . . .	1,508	1,773	15,494	10,087	20,125
Bulgaria . . . . .	218	73	573	293	774	Denmark . . . . .	481	346	7,335	3,724	5,005
Denmark . . . . .	908	690	3,230	3,591	7,648	Spain . . . . .	(7)	(7)	18	(7)	(7)
Spain . . . . .	1,512	5,820	7,951	11,330	22,472	Estonia . . . . .	13	11	170	359	485
Estonia . . . . .	46	31	343	187	478	Irish Free State . . . . .	...	...	(x) 5,809 (x)	6,080	11,279
Irish Free State . . . . .	...	...	(x) 441 (x)	265	1,786	Finland . . . . .	101	115	1,676	1,967	2,956
Finland . . . . .	13	20	97	104	220	France . . . . .	1,989	2,307	20,225	15,140	36,595
France . . . . .	6,572	8,907	33,266	37,768	90,116	Gr. Brit. and N. Ir. . . . .	10,218	6,310	89,005	79,708	134,811
Gr. Brit. and N. Ir. . . . .	14,872	8,530	61,097	55,308	141,747	Greece . . . . .	1,250	1,014	8,195	7,652	14,454
Greece . . . . .	620	130	1,742	1,113	2,480	Italy . . . . .	1,360	3,142	4,367	26,588	48,822
Hungary . . . . .	245	381	2,370	1,958	5,432	Latvia . . . . .	44	101	311	657	924
Italy . . . . .	1,074	1,171	6,801	7,350	16,619	Norway . . . . .	808	247	3,472	3,009	4,985
Latvia . . . . .	216	172	838	800	1,724	Netherlands . . . . .	1,418	1,144	10,318	13,336	20,858
Lithuania . . . . .	22	75	260	342	708	Portugal . . . . .	18	64	604	302	1,607
Norway . . . . .	463	450	2,842	1,720	4,705	Sweden . . . . .	...	...	(x) 1,984 (x)	1,944	2,939
Netherlands . . . . .	12,289	17,214	48,129	66,273	147,201	Switzerland . . . . .	(8) 578 (8)	714 (8)	8,087 (8)	7,083 (8)	11,094
Poland . . . . .	915	1,171	5,071	5,745	12,313	Czechoslovakia . . . . .	906	46	9,061	7,729	10,302
Sweden . . . . .	...	...	(x) 4,713 (x)	2,560	8,092	Ceylon . . . . .	53	37	381	779	597
Switzerland . . . . .	1,856	3,325	4,359	8,349	23,803	India . . . . .	...	1,373	(7)	705	3,082
Czechoslovakia . . . . .	1,855	1,620	6,984	7,055	18,237	Indochina . . . . .	(7)	46	53	317	571
Yugoslavia . . . . .	63	130	611	631	1,473	Japan . . . . .	...	...	(x) 4,278 (x)	3,424	10,964
Canada . . . . .	1,929	862	6,660	6,744	15,371	Java and Madura . . . . .	...	...	(x) 836 (x)	611	1,367
United States . . . . .	65,601	30,677	176,313	128,942	406,686	Syria and Lebanon . . . . .	46	11	(7)	94	101
Australia . . . . .	584	260	5,611	2,167	7,908	Egypt . . . . .	...	...	(x) 2,211 (x)	3,247	5,763
New Zealand . . . . .	...	...	(3) 545 (3)	500	1,504	Tunis . . . . .	(7)	35	(7)	(7)	(7)
						Union of South Afr. . . . .	...	...	(3) 529 (3)	842	1,988
						New Zealand . . . . .	...	...	(3) 174 (3)	185	497
<b>Totals . . . . .</b>	<b>138,771</b>	<b>109,274</b>	<b>494,772</b>	<b>452,862</b>	<b>1,156,092</b>	<b>Totals . . . . .</b>	<b>22,499</b>	<b>20,417</b>	<b>263,290</b>	<b>216,016</b>	<b>390,975</b>

(\*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

a) Excess of exports over imports. — b) Excess of imports over exports.

(1) Data up to 31st January. — (2) Data up to 30th September. — (3) Data up to 31st December. — (4) Data up to 30th November.

— (5) Data up to 30th June. — (6) See Net Imports. — (7) See Net Exports. — (8) Wheat only.



# STOCKS

## STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS

### IN GERMANY.

PRODUCTS	% Stocks: total production				% Available saleable quantities: total production			
	March 15, 1932	Feb. 15, 1932	March 15, 1931	March 15, 1930	March 15, 1932	Feb. 15, 1932	March 15, 1931	March 15, 1930
Winter wheat . . . . .	15.5	22.6	13.2	25.6	11.3	16.9	8.6	19.2
Spring wheat . . . . .	36.6	48.5	30.3	32.4	26.3	38.8	17.8	24.8
Winter rye . . . . .	18.6	25.1	25.8	31.3	6.1	9.9	11.5	15.9
Winter barley . . . . .	10.8	15.3	11.4	19.4	1.3	2.2	1.6	3.3
Spring barley . . . . .	21.5	31.6	16.4	25.8	8.1	15.3	3.9	12.0
Oats . . . . .	41.0	50.9	44.8	46.2	7.8	11.9	9.7	14.9
Potatoes (1) . . . . .	33.3	40.8	32.8	35.9	9.9	12.5	8.8	10.1

(1) The following % of total potato stocks were damaged: March 15, 1932: 6.1; March 15, 1931: 7.6.

Authority: *Preisberichtstelle beim Deutschen Landwirtschaftsrat.*

## STOCKS OF CEREALS IN COMMERCIAL ELEVATORS AND MILLS IN GERMANY (1).

PRODUCTS	March 31, 1932	February 29, 1932	March 31, 1932	February 29, 1932
	1,000 centals		1,000 bushels or barrels	
<b>WHEAT:</b>				
Grain, home grown . . . . .	8,248	9,634	13,746	16,057
Grain, imported . . . . .	2,465	2,292	4,108	3,822
Flour for bread, home grown . . . . .	2,721	3,086	1,388	1,575
Flour for bread, imported . . . . .	9	180	4	92
TOTAL (2) . . . . .	14,362	16,285	23,920	27,143
<b>RYE:</b>				
Grain, home grown . . . . .	3,514	4,387	6,275	7,834
Grain, imported . . . . .	4,028	3,505	7,193	6,259
Flour for bread, home grown . . . . .	1,082	1,301	552	664
Flour for bread, imported . . . . .	7	37	3	19
TOTAL (2) . . . . .	8,995	9,675	16,062	17,279
<b>BARLEY:</b>				
Home grown . . . . .	1,779	2,822	3,707	5,879
Imported . . . . .	888	1,124	1,745	2,342
TOTAL . . . . .	2,617	3,946	5,452	8,221
<b>OATS:</b>				
Home grown . . . . .	1,920	2,844	6,001	8,887
Imported . . . . .	18	26	55	82
TOTAL . . . . .	1,938	2,870	6,056	8,969

(1) See note under the corresponding table in the Bulletin for March, at page 218. The quantities of little importance which are kept in the small elevators and mills are included only in the data for February 29. — (2) Including flour in terms of grain, on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain (1,000 barrels of flour = 4,353.55 bushels of wheat or 4,384.80 bushels of rye).

## STOCKS IN ENGLAND AND WALES IN FARMERS' HANDS.

PRODUITS	% Stocks: total production				Estimated stocks in absolute figures							
	April 1,	Jan. 1,	April 1,	April 1,	April 1,	Jan. 1,	April 1,	April 1,	April 1,	Jan. 1,	April 1,	April 1,
	1932	1932	1931	1930	1932	1932	1931	1930	1932	1932	1931	1930
					1,000 centals				1,000 bushels (1)			
Wheat . . . . .	21	56	19	17	4,525	11,984	4,502	4,861	7,541	10,973	7,504	8,101
Barley . . . . .	12	38	12	16	3,038	6,518	2,016	3,517	4,247	13,580	4,200	7,327
Oats . . . . .	20	55	21	21	5,533	15,222	6,294	7,123	17,200	47,880	19,070	22,360
Potatoes . . . . .	11	42	15	28	5,860	22,557	9,318	22,310	9,781	37,595	15,531	37,184
Hay . . . . .	32	71	25	15	50,045	125,440	43,658	18,122	2,802	6,272	2,183	900
Straw . . . . .	26	63	21	19	21,616	52,662	17,920	18,144	1,081	2,633	896	907

(1) For hay and straw thousand short tons.

## GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	April	March	Feb.	April	April	April	March	Feb.	April	April
	1932	1932	1932	1931	1930	1932	1932	1932	1931	1930
	1,000 centals					1,000 bushels				
WHEAT:										
Grain . . . . .	8,376	9,336	9,792	6,960	6,036	13,960	15,560	16,320	11,600	11,560
Flour as grain . .	840	960	864	576	888	1,400	1,600	1,440	900	1,480
TOTAL . . . . .	9,216	10,296	10,656	7,536	7,924	15,360	17,160	17,760	12,500	13,040
Barley . . . . .	900	880	800	1,100	1,080	1,875	1,833	1,667	2,292	2,250
Oats . . . . .	448	320	448	1,024	672	1,400	1,000	1,400	3,200	2,100
Maize . . . . .	4,660	5,904	6,048	1,728	1,968	8,148	10,543	10,800	3,086	3,614

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.

## STOCKS OF WHEAT IN INTERIOR MILLS AND ELEVATORS IN THE UNITED STATES ON MARCH 1st.

Stocks of wheat in country elevators and the smaller interior mills, which are not included either in the monthly tables on stocks of wheat in 39 markets (commercial cereals) or in the quarterly reports on stocks of wheat in merchant mills and attached elevators, were reported as follows (figures in thousands) 1st March 1932: 44,761 centals (74,601 bushels); 1st March 1931: 49,923 centals (83,205 bushels); 1st March, 1930: 60,689 centals (101,149 bushels); 1st March 1929: 50,824 centals (84,707 bushels); 1st March 1928: 45,257 centals (75,428 bushels).

## STOCKS IN CANADA IN FARMERS' HANDS, ON MARCH 31.

PRODUCTS	% stocks: total production			Estimated stocks in absolute figures					
	1932	1931	1930	1932	1931	1930	1932	1931	1930
				1,000 centals			1,000 bushels		
Wheat . . . . .	19	22	15	35,191	53,180	27,782	53,651	88,688	46,304
Rye . . . . .	18	23	13	589	4,098	923	962	7,309	1,649
Barley . . . . .	28	42	21	8,955	27,880	10,228	18,056	57,042	21,809
Oats (1) . . . . .	85	45	31	39,538	65,815	29,460	123,697	204,110	92,068
Potatoes . . . . .	42	38	27	21,985	18,280	10,832	36,558	30,487	18,068
Linseed . . . . .	13	19	14	182	343	115	325	612	206

(1) Bushels of 32 lbs.

TOTAL STOCKS OF HOME GROWN CEREALS AND LINSEED IN CANADA ON MARCH 31 (1).

PRODUCTS	1932	1931	1930	1929	1928	1932	1931	1930	1929	1928
	1,000 centals					1,000 bushels				
Wheat . . . . .	145,980	168,057	137,188	149,765	135,763	243,300	280,095	228,646	249,609	226,272
Rye . . . . .	6,781	11,627	6,182	3,736	4,282	12,110	20,763	11,040	6,672	7,646
Barley . . . . .	13,920	40,622	21,535	23,027	15,420	29,000	84,030	44,865	49,223	32,124
Oats (2) . . . . .	45,560	71,493	35,926	64,335	61,138	142,375	223,415	112,270	201,048	191,057
Linseed . . . . .	982	1,566	684	969	2,147	1,754	2,797	1,222	1,780	3,834

(1) In the totals are included stocks in farmers' hands as well as commercial stocks cereals of Canadian origin in Canada (see special tables). — (2) Bushels of 32 lbs.

COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	April 1932	March 1932	Feb. 1932	April 1931	April 1930	April 1932	March 1932	Feb. 1932	April 1931	April 1930
	1,000 centals					1,000 bushels				
<b>WHEAT :</b>										
Canadian in Canada . . . . .	103,734	108,195	104,156	101,645	101,109	172,890	171,901	173,593	169,407	168,515
U. S. in Canada . . . . .	15,347	16,809	17,191	3,152	3,485	25,578	27,682	28,652	5,254	5,808
U. S. in the United States . . . . .	124,328	129,770	130,631	128,150	91,873	207,213	216,284	217,719	213,583	153,122
Canad. in the United States . . . . .	8,655	8,741	13,148	6,932	15,171	14,425	14,560	21,905	11,554	25,285
Total . . . . .	252,064	258,315	255,121	239,879	211,638	420,106	430,526	441,889	399,798	352,730
<b>RYE :</b>										
Canadian in Canada . . . . .	6,103	6,145	6,250	7,409	4,637	10,899	10,973	11,161	13,230	8,280
U. S. in Canada . . . . .	140	378	478	1,186	1,500	250	675	853	2,119	2,679
U. S. in the United States . . . . .	5,641	5,603	5,648	7,226	8,000	10,073	10,005	10,085	12,903	14,285
Canad. in the United States . . . . .	913	778	954	193	207	1,631	1,389	1,703	344	370
Total . . . . .	12,797	12,904	13,330	16,014	14,344	22,853	23,042	23,802	26,596	25,614
<b>BARLEY :</b>										
Canadian in Canada . . . . .	4,628	4,741	4,741	12,863	11,044	9,642	9,878	9,878	23,798	23,008
U. S. in Canada . . . . .	12	12	12	127	407	25	25	25	264	848
U. S. in the United States . . . . .	2,006	2,439	2,741	4,543	4,668	4,179	5,184	5,710	9,464	9,726
Canad. in the United States . . . . .	710	745	762	362	1,335	1,479	1,552	1,587	754	2,781
Total . . . . .	7,356	7,986	8,256	17,895	17,454	15,325	16,639	17,200	34,280	36,363
<b>OATS : (1)</b>										
Canadian in Canada . . . . .	5,093	4,966	4,972	5,058	5,226	15,917	15,519	15,588	15,807	16,332
U. S. in Canada . . . . .	0	1	4	213	741	0	2	12	665	2,314
U. S. in the United States . . . . .	5,055	5,739	5,471	5,823	6,235	15,796	17,985	17,096	18,213	19,484
Canad. in the United States . . . . .	0	1	1	8	156	1	2	2	10	438
Total . . . . .	10,148	10,707	10,448	11,102	12,358	31,714	33,453	32,698	34,695	38,613
<b>MAIZE :</b>										
U. S. in Canada . . . . .	0	438	410	212	60	0	871	732	878	107
of other origin in Canada . . . . .	808	1,000	1,122	336	588	1,443	1,786	2,008	600	1,051
U. S. in the United States . . . . .	12,652	19,356	7,689	12,413	14,376	22,593	18,492	14,176	22,167	25,671
Total . . . . .	13,460	20,794	9,211	12,961	15,024	24,036	21,149	16,917	23,145	26,829

(1) All oats expressed in bushels of 32 lbs.

## QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

PRODUCTS	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	April 1932	March 1932	Feb. 1932	April 1931	April 1930	April 1932	March 1932	Feb. 1932	April 1931	April 1930
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat) . .	35,203	34,790	30,413	28,814	20,530	58,072	57,984	50,688	48,024	34,216
Rye . . . . .	3,571	1,253	1,219	158	187	6,377	2,237	2,177	283	334
Barley . . . . .	3,200	2,756	3,084	3,704	3,004	6,677	5,742	6,425	7,717	6,258
Oats . . . . .	2,336	2,995	2,435	912	586	7,300	9,380	7,610	2,850	1,830
Maize . . . . .	12,062	12,134	14,501	9,365	6,134	21,540	21,669	25,894	16,723	10,054

Authority: *Broomhall's Corn Trade News*.

## STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930	March 1932	Feb. 1932	Jan. 1932	March 1931	March 1930
	1,000 centals					1,000 bales (counting round as half bales)				
In consuming establishments . . . . .	7,493	7,818	7,833	7,072	8,583	1,566	1,634	1,637	1,478	1,763
In public storage and at compresses . .	41,950	45,510	48,003	31,787	20,417	8,767	9,511	10,032	6,643	4,189
TOTAL . . .	49,443	53,328	55,836	38,859	29,000	10,332	11,145	11,669	8,121	5,952

## STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	April 1932	March 1932	Feb. 1932	April 1931	April 1930	April 1932	March 1932	Feb. 1932	April 1931	April 1930
	1,000 centals					1,000 bales (1 bale = 478 lbs.)				
<b>Great Britain:</b>										
American . . . . .	2,129	1,989	2,111	2,593	2,165	445	416	442	543	453
Argentine, Brazilian, etc. . . . .	63	33	98	212	700	13	17	21	44	146
Peruvian, etc. . .	173	194	226	286	302	36	41	47	60	63
East Indian, etc.	505	552	575	864	201	105	115	120	181	42
Egyptian, Sudanese . . . . .	1,625	1,470	1,392	1,479	1,028	340	308	291	309	215
Other (1) . . . . .	120	126	140	241	266	25	26	29	50	56
TOTAL . . .	4,615	4,414	4,542	5,675	4,662	965	923	950	1,187	975
<b>Bremen:</b>										
American . . . . .	1,527	1,486	1,601	2,506	2,161	319	311	335	524	452
Other . . . . .	33	22	23	36	30	7	5	5	8	6
TOTAL . . .	1,560	1,508	1,624	2,542	2,191	326	316	340	532	458
<b>Le Havre:</b>										
American . . . . .	812	805	752	1,691	1,310	170	168	157	354	274
Other . . . . .	55	55	109	155	127	11	12	23	32	27
TOTAL . . .	867	860	861	1,846	1,437	181	180	180	386	301
<b>Total Continent (2):</b>										
American . . . . .	3,238	3,141	3,266	4,808	4,083	677	657	683	1,006	854
Argentine, Brazilian, etc. . . . .	26	32	39	90	63	5	7	8	19	13
E. Indian, Australian, etc. . . . .	91	90	103	219	100	19	19	23	46	21
Egyptian . . . . .	154	124	157	102	101	32	26	33	21	21
W. Indian, W. African, E. African, etc. . . . .	21	28	28	52	77	5	6	6	11	16
TOTAL . . .	3,530	3,415	3,593	5,271	4,424	733	715	753	1,103	925

Authority: *Liverpool Cotton Ass*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	April 1932	March 1932	Feb. 1932	April 1931	April 1930	April 1932	March 1932	Feb. 1932	April 1931	April 1930
	1,000 centals					1,000 bales (1 bale = 478 lbs.)				
Bombay (1) . . . .	2,524	2,180	1,760	3,693	5,149	528	456	368	773	1,077
Alexandria . . . .	4,842	5,065	5,468	3,081	3,020	1,013	1,060	1,144	1,003	820

Authorities: *East Indian Cotton Ass.* and *Bourse de Minet el-Bussal.*

(1) Stocks held by exporters, dealers and mills.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGES 160 TO 163 OF THE CROP REPORT FOR FEBRUARY

(SEE ALSO THE SAME HEADING IN THE PRECEDING CROP REPORTS FOR THIS YEAR).

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Belgium . . . . .	Wheat, rye, barley, wheat- and rye flour. . . .	March 27	(1)	(1)
" . . . . .	Oats, maize . . . . .	"	(2)	(2)
" . . . . .	Oats . . . . .	"	Belg. frs 24.15	9.82
" . . . . .	Wheat- and rye flour . . . . .	"	" 4.60	11.45
Spain . . . . .	Maize . . . . .	April 3	pes. 5.00	11.59
" . . . . .	Wheat (3) . . . . .	April 14	" 8.50	17.48
France . . . . .	Whole cereals . . . . .	April 2	" (4)	(4)
" . . . . .	Wheat- and rye flour . . . . .	"	" (5)	(5)

(1) *Ad valorem* turnover tax: 2.3 %. — (2) *Ad valorem* turnover tax: 4.6 %. — Imports permitted for 500,000 quintals (1,837,155 bushels); duty fixed till April 20. — (4) *Ad valorem* import tax: 2 %. — (5) *Ad valorem* import tax: 4 %.

## MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTION	Average (2)									
	April 15, 1932	April 8, 1932	April 1, 1932	March 24, 1932	March 1932	April 1932	April 1930	Commercial Season		
								1930-31	1929-30	
<b>WHEAT.</b>										
Budapest (b): Tisza region (78-80 kg. p. hl.; pengő p. quintal) . . . . .	13.65	13.70	13.62	14.02	14.03	15.98	n. 23.50	15.34	22.04	
Braila: Good quality (lei p. quintal) (3) . . . . .	325	320	320	310	(1324	326	582	\$51	012	
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.) . . . . .	64 1/2	60 1/8	59 3/4	59 1/4	63 1/8	59	110 1/2	64 1/4	124 1/8	
Chicago: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	60 1/2	53 7/8 n.	52 1/4 n.	52 1/4	55 7/8	82 3/4	108	78	114 1/8	
Minneapolis: No. 1 Northern (cents p. 60 lbs.) . . . . .	71 1/8	65 1/4	63 1/8	62 1/4	68 5/8	79 1/2	108 1/2	77 7/8	117 1/2	
New York: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	72 1/8	65 1/8	64 3/4	64 1/4	67 3/4	n. q.	113	n. 91 1/8	121 1/4	
Buenos Aires (a); Barletta (30 kg. p. hectol. — pesos paper p. quintal) . . . . .	7.10	6.95	6.70	6.70	6.96	5.60	10.65	6.83	10.65	
Karachi: Karachi white, 2 % barley, 1 1/2 % dirt (rupees p. 656 lbs.) . . . . .	22-11-0	21-14-0	20-10-0	21-8-0	22-10-0	0.18-15-0	33-2-6	19-15-2	30-6-0	
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	26.30	26.10	25.50	25.20	24.77	28.80	26.87	26.00	25.33	
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No. 3 Manitoba . . . . .	(5) 11.46	(5) 11.08	(5) 10.86	(5) 10.62	(5) 11.21	(5) 12.05	19.30	(5) 12.65	21.30	
No. 2 Hardwinter . . . . .	10.77	n. q.	n. q.	n. q.	n. q.	n. q.	18.56	n. 13.00	19.49	
Burusso (79 kg. p. hectol.) . . . . .	(6) 9.36	(6) 9.20	(6) 9.01	(6) 8.92	(6) 9.22	9.77	(7) 18.02	11.10	18.72	
Antwerp (Belgian francs p. quintal):										
Home grown . . . . .	79	78	80	n. q.	n. q.	92 1/4	147 1/2	95 1/2	154 1/4	
No. 2 Hard Winter, Gulf . . . . .	(8) 89	(8) 86	(8) 88	(8) 80	(8) 92 1/4	107	162	112 1/2	171	
Paris: Home grown, 75-77 kg. (francs p. quintal) . . . . .	169.50	169.00	175.00	174.25	173.20	185.95	132.35	175.00	189.40	
London: Home grown (shillings p. 504 lbs.) . . . . .	26/7	26/6	26/6	n. q.	26/-	22/-	39/4	27/1	40/10	
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):										
South Russian (on sample) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	21.10	n. q.	23/7	n. q.	
No. 3 Manitoba . . . . .	28/9	26/10 1/2	26/6	28/-	20/5	23/2	41/1	25/4	45/2	
No. 2 Hard Winter . . . . .	28/-	26/4 1/2	25/-	26/3	28/3	n. q.	39/7	26/4	41/5	
White Pacific . . . . .	n. q.	n. q.	(9) 20/-	(9) 30/-	30/-	25/-	40/11	26/7	42/3	
Rosafé (63 1/2 lbs.), afloat . . . . .	(10) 25/3	(10) 24/3	(10) 23/3	(10) 23/3	(10) 25/4	(11) 20/0	(1) 138/5	23/5	40/3	
Choice White Karachi . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	40/11	27/-	42/2	
Australian . . . . .	27/9	27/3	26/6	26/9	27/11	21/10	40/7	25/7	43/6	
Milan (b): Home grown, soft (lire p. quintal) . . . . .	118.50	117.50	117.50	118.00	118.65	106.50	135.75	109.10	131.30	
Genoa c. i. f. (shillings p. metric ton): La Plata . . . . .	(13) 2.26	n. q.	n. q.	n. q.	n. q.	102/1	177/4	110/-	181/6	
<b>RYE.</b>										
Budapest (b): Home grown (pengő p. quintal) . . . . .	14.93	15.07	15.12	15.52	15.27	13.24	n. 11.10	10.70	13.4	
Berlin: Home grown (Reichsmarks per quintal) . . . . .	n. q.	19.90	20.00	19.50	19.45	10.10	16.00	17.18	17.04	
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. quintal) . . . . .	10.17	10.10	10.11	9.52	9.44	n. q.	(4) 13.80	n. 7.65	14.57	
Minneapolis: No. 2 (cents p. 56 lbs.) . . . . .	46 1/2	44 1/2	46 1/2	45	47 1/8	35	71 1/8	42 1/8	80 1/8	
Groningen (c): Home grown (florin p. quintal) . . . . .	5.80	5.50	5.40	5.25	5.10	4.20	5.07	4.45	6.33	
<b>BARLEY.</b>										
Braila: Average quality (lei p. quintal) (3) . . . . .	325	325	320	305	(15) 314	261	271	232	304	
Winnipeg: No. 4 Western (cents p. 48 lbs.) . . . . .	30 1/4	36 1/4	36 1/8	36 1/4	37 1/8	25 7/8	45	26 1/8	51 7/8	
Chicago: Feeding (cents p. 48 lbs.) . . . . .	52	50	49	45	49 1/2	43 3/4	57 1/2	43 1/8	57 1/8	
Berlin: Home grown fodder (Reichsmarks per quintal) . . . . .	18.50	17.80	17.50	17.45	17.57	22.79	18.25	19.52	17.40	
Antwerp: Danube (francs p. quintal) . . . . .	88	87	83 1/2	84	83	78	00	73 1/4	107 1/4	
London: English malting (shillings p. 448 pounds) . . . . .	37/6	37/6	37/6	n. q.	37/6	33/4	34/4	35/8	30/-	
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):										
Danubian 3 % . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	16/4	19/7	15/2	22/3	
Russian (Aroff-Black sea) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	19/7	14/3	18/11	
Canadian Western, No. 3 . . . . .	23/-	22/6	22/-	22/6	23/6	15/9	24/2	15/11	27/-	
Californian malting (shillings p. 448 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	37/6	27/6	30/-	27/8	32/6	
Groningen (c): Home grown winter (fl. p. quintal) . . . . .	6.55	6.10	6.00	5.95	5.90	5.10	6.80	4.97	7.55	

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) The specific gravity changes too frequently for indication. — (4) March 18: 345 — (5) No. 3 Manitoba. — (6) 80-81 kg. p. hl. — (7) 78 kg. p. hl. — (8) No. 1 Hard Winter. — (9) Soft white Pacific. — (10) 64 lbs. p. bushel. — (11) 63 lbs. p. bushel. — (12) 62 1/2 lbs. p. bushel. — (13) Price in \$ per quintal. — (14) 75 kg. p. hl. — (15) March 18: 370.

PRODUCTS, MARKETS AND DESCRIPTION	April 15, 1932	April 8, 1932	April 1, 1932	March 24, 1932	Average (r)				
					March 1932	April 1932	April 1930	Commercial Season	
								1930-31	1929-30
<b>OATS.</b>									
Braila: Good quality (lei p. quintal) (a) . . . . .	305	302	300	305	310	287	282	247	256
Winnipeg: No. 2 White (cents per 34 lbs.) . . . . .	32 7/8	30 1/4	29 1/2	29 1/4	30	28	54 1/2	30	58 1/4
Chicago: No. 2 White (cents per 32 lbs.) . . . . .	24 1/2	24 1/2	24	23 1/2	24 3/4	30 7/8	44 1/2	32 7/8	44 3/4
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	5.85	5.55	5.35	5.30	5.45	3.44	4.06	3.58	5.30
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	16.75	16.55	16.10	16.15	15.65	17.70	16.47	16.17	15.62
Paris: Home grown, black and other (francs p. quintal) . . . . .	117.00	115.50	116.00	113.00	110.95	89.40	71.45	81.00	81.15
London: Home grown white (shillings p. 336 lbs.) . . . . .	21/9	21/8	21/9	n. q.	21/3	17/10	18/9	18/4	21/-
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.): . . . . .									
Danubian (39-40 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. 14.8	n. 12/1	n. 16/4
Plate (f. a. q.) . . . . .	15/3	19/9	14/-	14 7/2	15/3	10/7	14/5	10/9	16/1
Chilian Tawny . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	11/7	14/10	12/-	17/3
Milan (b): spot (lire p. quintal): . . . . .									
Home grown . . . . .	n. 76.50	n. 76.50	n. 76.50	n. 76.50	n. 76.50	73.50	76.00	78.95	80.75
Foreign imported . . . . .	65.50	63.50	63.50	63.50	63.65	57.50	68.00	60.40	74.30
<b>MAIZE.</b>									
Braila: Danube (lei p. quintal) . . . . .	225	212	199	210	240	231	325	210	309
Chicago: No. 2 Mixed American (cents p. 56 lbs.) . . . . .	34 1/2	31 3/4	34	33	34 3/4	50 1/2	83 3/8	58 1/4	85 7/8
Buenos Aires (a): Yellow Plate (pesos paper p. quintal) . . . . .	4.70	4.75	4.55	4.65	4.97	3.51	6.47	3.82	6.17
Antwerp, spot (Belgian francs p. quintal): . . . . .									
Bessarabian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	80 1/4	n. q.	71 1/4	n. 97 1/4
Cinquantino . . . . .	60	66	65	66	64 1/2	91 1/4	131 1/2	81	131 1/4
Yellow Plate . . . . .	62 1/2	62 1/2	62 1/2	63	61 5/8	70 1/4	125 1/2	65	109 1/4
London and Liverpool, parcels, c. i. f. (shillings p. 480 lbs.): . . . . .									
Danube . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	6) 19/	25/1	n. 17/4	24/11
Yellow Plate . . . . .	19/3	19/-	19/-	19/-	19/10	18/3	27/5	15/6	25/3
No. 2 White African . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	7) 18/10	28/1	n. 18/11	28/-
Milan (b): Home grown (lire p. quintal) . . . . .	77.50	77.50	77.50	76.50	71.85	51.00	70.00	51.00	71.35
<b>RICE (CLEANED).</b>									
								1931	1930
Milan (b): Maratelli (lire p. quintal) . . . . .	151.50	151.50	151.50	151.50	147.85	118.50	169.35	117.35	152.15
Rangoon: No. 2 Burma (rupees p. 7500 lbs.) . . . . .	205	205	300	320	327 1/2	235	440 1/2	249 3/4	393 3/4
Salgon (Indochinese piastres p. quintal): . . . . .									
No. 1 Round white (25 % broken) . . . . .	6.13	5.90	5.98	6.15	6.27	6.30	13.13	6.73	11.36
No. 2 Japan (40 % broken) . . . . .	5.63	5.40	5.50	5.65	5.84	5.65	12.80	6.20	10.89
London (a): c. i. f. (shillings p. 112 lbs.): . . . . .									
Spanish Belloch, No. 3 oiled . . . . .	12/6	12/6	12/6	12/10 1/2	13/3	12/3	14/9	11/11	14/1
Italian good, No. 6 oiled . . . . .	14/-	14/-	14/-	14/-	14/-	13/11	15/11	18/7	14/11
American Blue Rose . . . . .	16/-	16/-	16/3	17/1 1/2	17/6	17/9	23/6	18/7	21/9
Burma, No. 2 . . . . .	8/10 1/2	8/9	9/3	9/9	9/10	7/5	12/-	7/11	10/11
Salgon, No. 1 . . . . .	8/10 1/2	8 1/4	8 7/12	9/-	9/3	7/4	18/8	8/1	11/8
Siam, Garden, No. 1 . . . . .	8/10/-	8/10/-	8/10/-	8/10/3	10/7	9/1	15/4	9/5	14/-
Tokio: Various qualities (yens p. koku) . . . . .	...	...	...	...	...	18.22	27.22	18.46	25.57
<b>LANSBED.</b>									
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	9.40	9.40	9.25	9.35	9.54	10.34	10.79	10.82	17.19
Antwerp: Plate (Belgian francs p. quintal) . . . . .	101	102	104 1/2	106	108 3/4	153	820	146	284 1/4
Hull, c. i. f.: Plate (p. sterling p. 1. ton) . . . . .	7-18-8	7-15-0	7-17-6	8-5-0	8-11-8	8-16-10	18-0-0	8-14-1	15-9-5
London, c. i. f.: Bombay bold (p. st. p. long ton) . . . . .	11-7-6	11-2-6	11-10-0	11-11-8	12-2-30	n. q.	20-4-4	11-6-6	17-14-4
Duluth: No. 1, Northern (cents p. 56 lbs.) . . . . .	138	134 1/2	138	140	140 1/4	155 1/4	268 1/4	148	236

(a) The higher prices — (b) Saturday prices.

(c) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (d) The specific gravity changes are for reference only. — (e) March 1931: 320. — (f) Weight not indicated. — (g) March, 1931: 173.

(h) Sen. Calcutta Forward. — (i) White East, amount. — (j) Siam special; in Nov. 1931 prices of this quality were 4 1/2 c. higher than those of Siam Garden, N. 1. — (k) Siam special; average Feb. 1932: 11/6; average Jan. 1932: 11/7.

PRODUCTS, MARKETS AND DESCRIPTION	April 15, 1932	April 8, 1932	April 1, 1932	March 24, 1932	Average (1)					
	1932	1932	1932	1932	March 1932	April 1932	April 1930	Commercial Season	1930-31	1929-30
<b>COTTONSEED.</b>										
Alexandria : Sakellaridis (piastres per ardeb) . . . . .	54.7	53.5	55.0	57.1	59.4	57.7	73.7	52.2	67.0	
Hull : Sakellaridis (p. sterl. per long ton) . . . . .	5-17-6	5-7-6	5-15-0	5-17-6	6-2-10	6-2-6	7-8-0	5-12-6	6-18-2	
<b>COTTON.</b>										
New Orleans : Middling (cents per lb.) . . . . .	6.26	6.02	6.18	6.52	6.80	9.90	15.83	10.07	16.17	
New York : Middling (cents per lb.) . . . . .	6.30	6.10	6.30	6.60	6.91	10.25	16.42	10.38	16.00	
Bombay : M. g. Broach f. g. (rupees per 784 lbs.) . . . . .	187	178	183	199	211 1/4	198 1/2	261	101 1/4	283 1/2	
Alexandria (a) (talaris per kantar) :										
Sakellaridis f. g. f. . . . .	11.67	11.67	11.92	12.17	12.94	15.78	27 3/4	17.12	28 3/4	
Ashmouni (Upper Egypt) f. g. f. . . . .	10.20	10.05	10.15	10.65	11.27	11.65	19 1/4	12.00	19 1/4	
Bremen : Middling (U. S. cents per lb.) . . . . .	7.62	7.31	7.44	7.81	8.15	11.35	17.78	11.59	18.27	
M. g. Broach fully good (pence per lb.) . . . . .	n. 4.65	n. 4.50	n. 4.80	n. 5.10	n. 5.34	n. 4.84	n. 6.11	n. 4.63	n. 6.83	
Le Havre : Middling, Gulf (francs per 50 kg.) . . . . .	228	219	225	n. q.	246	352	520	349	545	
Liverpool (pence per lb.) :										
Middling fair . . . . .	n. 6.00	n. 5.73	n. 5.81	n. 6.17	n. 6.49	n. 6.83	n. 10.00	n. 6.92	n. 10.39	
Middling . . . . .	5.00	4.73	4.81	5.15	5.47	5.63	8.74	5.72	9.08	
São Paulo, good fair . . . . .	n. 5.20	n. 4.98	n. 5.01	n. 5.37	n. 5.60	5.83	8.61	5.91	8.02	
M. g. Broach, fully good . . . . .	n. 4.51	n. 4.36	n. 4.41	n. 4.82	n. 5.09	n. 4.91	n. 6.15	n. 4.25	n. 6.80	
Sakellaridis, fully good fair . . . . .	6.60	6.55	6.60	7.05	7.12	8.75	14.20	9.08	14.52	
<b>BUTTER.</b>										
Copenhagen (a) (Kr. p. quintal) . . . . .	176	170	170	170	2182	201	225	200	245	
Maastricht, auction (b) : Dutch (florins p. kg.) . . . . .	0.99	0.98	0.99	0.98	1.08	1.43	1.56	1.38	1.10	
Hamburg, auction (b) : Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . . . .	115.81	115.08	119.80	127.16	127.59	128.57	135.55	131.22	146.07	
Kempten (b) : Allgäu butter (Pfennige p. half kg.) 3) 109 3) 109 3) 114 3) 120 3) 120 110 123 110 128	3) 109	3) 109	3) 114	3) 120	3) 120	110	123	110	128	
London (c) (shillings p. cwt.) :										
British blended . . . . .	135/4	135/4	135/4	135/4	135/4	144/8	158/8	140/4	158/8	
Danish . . . . .	122/-	122/-	122/-	124/-	134/-	128/6	147/6	133/1	153/6	
Irish creamery, salted . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	119/3	131/10	
Dutch . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	128/6	148/-	132/1	151/11	
Argentine . . . . .	113/-	115/-	115/-	116/-	114/6	117/0	135/-	117/7	135/10	
Siberian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	132/-	(4) 97/4	131/6	
Australian, salted . . . . .	113/-	112/-	111/-	111/-	111/3	115/9	136/6	116/8	135/9	
New Zealand, salted . . . . .	116/-	116/-	116/-	116/-	116/6	117/3	133/6	119/11	137/8	
<b>CHEESE.</b>										
Milan (lire per quintal) :										
Parmigiano-Reggiano, 1st quality of last year's production . . . . .	1,000	1,000	1,000	1,000	987	1,112	1,119	1,108	1,160	
Green Gorgonzola, mature, choice . . . . .	460	500	500	500	400	645	702	610	671	
Rome : Roman pecorino, choice (lire p. quintal) . . . . .	1,287	1,287	1,287	1,225	1,209	1,094	1,238	1,121	1,207	
Alkmaar : Edam 40 + 40% butterfat, with the country's cheescemark, factory cheese, small; florins, p. 50 kg.) . . . . .	21.00	22.50	22.50	23.00	5) 25.87	32.62	39.00	32.63	40.83	
Gouda : Gouda 45 + (whole milk cheese, with the country's cheescemark, home made; florins, p. 50 kg.) . . . . .	21.00	22.50	23.00	24.50	6) 27.12	35.50	41.12	37.03	45.56	
Kempten (b) (Pfennige per half kg.) :										
Softcheese, green (20 % butterfat) . . . . .	20 1/2	20 1/2	20 1/2	20 1/2	20	21	24 1/2	24	27	
Emmenthal from the Allgäu (whole milk cheese) 1st quality . . . . .	83	83	83	83	83	98 1/2	7) 100	97 1/2	97	
London (c) (shillings per cwt.) :										
English Cheddar . . . . .	120/-	120/-	122/-	122/-	121/-	106/-	118/6	99/10	108/4	
Canadian . . . . .	78/6	79/6	78/-	78/-	78/6	80/-	101/-	75/6	93/11	
New Zealand . . . . .	66/-	65/6	65/6	64/6	64/6	57/-	81/9	63/2	82/2	
Liverpool (c) : Engl. Cheshire, ungraded (sh. p. cwt.)	137/8	137/8	137/8	137/8	137/8	103/10	87/8	94/3	96/5	

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) 18 March: 170. —  
 (3) Quoting system changed: actual prices are generally 3 Pf. higher than according to the ancient system used in Kempten.  
 — (4) Average calculated from the prices for the Fridays and the Thursdays which precede. — (5) 18 March: 24.00.  
 — (6) 18 March: 25.00. — (7) Average price for all qualities.



## QUARTERLY REVIEW OF PRICES (1)

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year (2)	
		March,	Feb.	Jan.	Oct.-	Jan.	Jan.-	1930-31	1929-30
		1932	1932	1932	Dec. 1931	March, 1931	March, 1930		
GERMANY (Prices in Reichsmarks per quintal).									
A I	Wheat (Berlin) . . . . .	24.77	24.60	22.87	21.82	27.30	24.00	26.39	25.00
	Rye (Berlin) . . . . .	19.45	19.75	19.67	19.20	16.43	15.60	17.15	17.27
	Barley, feeding (Berlin) . . . . .	17.57	15.86	15.47	15.79	20.08	15.07	19.64	17.43
	Oats (Berlin) . . . . .	15.65	14.85	14.05	14.84	14.78	13.27	16.28	15.77
	Potatoes (Berlin) . . . . .	4.04	3.80	3.60	3.25	2.73	4.12	3.29	4.26
A II	Milk, fresh (Berlin) . . . . .	16.20	13.88	12.25	14.40	18.14	15.00	17.62	16.89
	Butter (Hamburg) . . . . .	225.18	270.86	216.70	244.78	292.80	324.97	282.10	330.68
	Cheese, Emmentaler variety (Kempten) (3). . . . .	166.00	166.00	169.50	187.50	197.00	204.00	192.00	205.00
	Beef, live weight (Berlin) . . . . .	69.70	70.00	72.40	72.65	101.35	112.80	106.32	114.84
	Veal, live weight (Berlin) . . . . .	76.20	64.80	70.80	87.45	110.35	137.25	126.23	143.02
	Pork, live weight (Berlin) . . . . .	76.20	76.20	76.60	90.05	104.91	152.50	110.44	134.09
B I	Basic slag (Aachen) (4) . . . . .	0.225	0.225	0.225 (5)	0.22	0.32	0.32	0.30	0.31
	Superphosphate of lime 18 % . . . . .	5.96	5.96	5.96 (6)	6.16	6.56	6.65	6.51	6.51
	Potash salts 18-22 % (4) . . . . .	...	0.170	0.170	0.152	0.152	0.152	0.147	0.152
	Sulphate of Ammonia (1) . . . . .	0.76	0.76	0.74	0.723	0.85	0.90	0.83	0.86
	Nitrate of lime (1) . . . . .	0.99	0.98	0.98	0.967	1.05	1.06	1.03	1.05
B II	Wheat bran (Hamburg) . . . . .	10.06	8.72	8.21	9.02	10.58	8.02	9.97	9.33
	Linsced cake (Hamburg) . . . . .	12.29	11.66	11.61	13.05	15.63	19.08	15.39	21.08
	Cocunut cake (Hamburg) . . . . .	12.65	10.69	10.40	11.13	13.33	14.82	13.32	16.91
	Groundnut cake (Hamburg) . . . . .	13.51	12.36	12.31	12.41	12.45	15.20	12.50	17.55
	Crushed soya extraction residue (Hamburg) . . . . .	12.06	10.86	10.17	11.13	11.01	14.26	13.44	16.50
DENMARK (Prices in Danish crowns per quintal).									
A I	Wheat (Copenhagen) . . . . .	12.62	11.25	11.00	10.58	10.40	15.20	12.11	16.08
	Barley (Copenhagen) . . . . .	14.87	13.92	13.75	12.94	10.40	13.21	11.18	14.13
	Oats (Copenhagen) . . . . .	13.75	13.00	13.00	12.58	11.20	11.23	11.86	18.69
A II	Butter (Copenhagen) . . . . .	182.50	230.00	195.00	214.65	228.35	279.00	225.00	280.00
	Eggs . . . . .	64.40	85.00	117.50	143.65	114.00	133.35	121.00	149.00
	Pork, live weight . . . . .	67.20	64.00	62.00	72.00	86.00	157.00	98.00	155.00
B I	Superphosphate 18 % . . . . .	5.95	5.95	5.80	5.37	5.93	6.40	5.85	6.22
	Potash salts 40 % . . . . .	13.75	13.75	13.50	12.54	12.95	13.30	12.62	13.05
	Sulphate of ammonia . . . . .	12.35	12.15	n. q.	n. q.	17.58	19.10	17.43	18.55
	Nitrate of lime, Norwegian . . . . .	13.45	13.35	n. q.	n. q.	16.82	16.95	16.35	16.47
B II	Rye, imported (Jutland) . . . . .	12.03	11.15	11.15	11.90	7.85	12.60	8.60	13.70
	Maize, Plate (Copenhagen) . . . . .	(7) 9.85	(7) 9.22	(7) 8.72	(7) 8.86	7.73	12.05	8.30	13.47
	Wheat bran (Copenhagen) . . . . .	10.78	9.65	9.17	9.11	9.22	10.59	9.12	11.49
	Cotton seed cake (Copenhagen) . . . . .	12.56	12.67	12.97	13.08	14.11	17.91	14.97	18.96
	Sunflower seed cake (Copenhagen) . . . . .	11.14	11.02	12.20	12.92	12.36	14.35	12.55	15.95
	Groundnut cake (Copenhagen) . . . . .	15.70	15.72	15.85	14.78	12.35	15.46	12.68	17.27
	Crushed soya extraction residue (Copenhagen) . . . . .	14.42	13.52	13.15	13.01	13.37	14.28	13.08	16.00

(1) Each quarter a list is published for several countries containing prices of plant (A I) and animal (A II) products sold by the farmer, as well as of fertilisers (B I), and of concentrated feeding stuffs for livestock (B II) bought by the farmer.

In the case where the market is not indicated, the price is the average one for the country. — The prices paid to farmers for sugar-beet are generally fixed once a year and therefore are not inserted in these tables.

(2) July to June — (3) From January 1931 prices of the first quality, before that date average prices of all qualities. —

(4) Prices per unit contained in one quintal. — (5) Dec.: 0.195. — (6) Nov.-Dec.: 5.96. — (7) Price in Jutland.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		March	Feb.	Jan.	Oct.-	Jan.-	Jan.-	1930-31	1929-30
		1932	1932	1932	Dec. 1931	March 1931	March 1930		
FRANCE (Prices in francs per quintal).									
A I	Wheat (Paris) . . . . .	173.20	171.60	167.45	162.35	177.05	153.20	173.90	169.70
	Rye (Paris) . . . . .	102.00	98.00	100.00	97.35	81.35	79.00	84.00	73.40
	Malting barley (Paris) . . . . .	101.00	96.00	98.00	98.65	92.35	81.15	92.35 <sup>n</sup>	93.00
	Oats (Paris) . . . . .	110.95	105.80	101.50	91.95	58.10	72.75	79.80	90.20
	Wine, red (southern markets) (hectolitre) . . . . .		84.00	86.00 1)	86.35	154.00	79.00	151.00	80.00
A II	Beef, dead weight (Paris) . . . . .	687.00	693.00	698.00 2)	769.00	1,042.00	870.00	1,050.00	916.00
	Pork, live weight (Paris) . . . . .	580.00	541.00	500.00	535.00	614.00	880.00	665.00	851.00
	Mutton, dead weight (Paris). . . . .	1,061.00	953.00	1,010.00	1,037.00	1,522.00	1,500.00	1,504.00	1,452.00
B I	Basic slag, 18 % (Lorraine) . . . . .	23.40	43.40	23.40	23.40	25.20	26.10	24.30	25.95
	Superphosphate 14 % (North and East) . . . . .	26.50	26.50	27.00	28.15	30.40	31.75	31.15	31.60
	Sylvinite, minimum 12 % . . . . .	10.60	10.60	10.60	10.60	10.60	10.65	10.60	10.90
	Nitrate of soda (Dunkirk) . . . . .	99.00	98.00	97.50	105.00	110.00	118.15	109.10	115.70
	Sulphate of ammonia 20.4 % . . . . .	101.00	100.00	99.50	104.25	114.00	120.30	112.20	118.85
B II	Linseed cake (North) . . . . .	75.00	76.25	80.00	84.00	103.00	120.00	103.00	120.00
	Coconut cake (Marseilles) . . . . .	67.50	68.00	70.00	71.00	67.00	96.00	73.00	102.00
	Groundnut cake (Marseilles) . . . . .	77.50	80.00	80.00	82.00	81.00	110.00	85.00	116.00

GREAT BRITAIN (A: Prices in shillings and pence per cwt;  
B: Prices in pounds sterling, etc. per long ton).

A I	Wheat . . . . .	6/3	5/10	6/4	6/8	5/3	9/4	6/6	9/8
	Barley . . . . .	6/11	6/7	6/7	6/10	5/7	6/10	5/10	7/8
	Oats . . . . .	8/-	7/7	7/6	7/0	6/1	6/0	6/4	7/0
A II	Potatoes (London) . . . . .	11/4	10/7	12/1	8/3	6/11	3/5	7/-	4/-
	Butter (London) . . . . .	134/-	130/8	133/-	139/-	140/5	180/5	144/0	177/4
	Cheese, Cheddar (London) . . . . .	121/-	115/-	100/6	97/0	98/8	113/3	98/4	109/1
	Beef, dead weight (London) . . . . .	77/-	74/8	72/4	69/3	76/3	86/6	79/2	82/10
	Mutton, dead weight (London) . . . . .	78/2	77/-	79/4	80/8	99/9	111/-	107/10	109/8
	Pork, dead weight (London) . . . . .	74/8	73/6	77/-	77/9	103/10	135/4	102/10	120/2
B I	Basic slag 14 % (London) . . . . .	2-1-0	2-1-0	2-1-0	2-2-8	2-3-0	2-3-0	2-2-3	2-3-1
	Superphosphate, 16 % (London) . . . . .	2-17-0	2-17-0	2-17-0 <sup>3</sup>	2-15-8	3-2-8	3-6-0	3-3-6	3-6-0
	Kainit 14 % (London) . . . . .	3-6-0	3-6-0	3-7-0	3-0-8	3-3-8	3-3-0	3-1-6	3-1-2
	Nitrate of soda, 15 1/2 % (London) . . . . .	0-0-0	8-16-0	8-14-0	8-11-0	9-19-4	10-1-0	9-16-8	10-0-2
	Sulphate of ammonia 20.6 % (London) . . . . .	7-0-0	7-0-0	7-0-0	6-10-0	9-9-4	10-1-0	9-7-2	9-18-6
B II	Bran, British (London) . . . . .	6-13-0	6-9-9	6-0-6	5-14-6	4-18-11	5-8-9	4-16-4	5-13-10
	Bran, middlings, imported (London) . . . . .	6-4-3	5-17-6	5-15-0	5-11-4	4-6-5	5-0-8	4-11-5	5-12-1
	Linseed cake, English (London) . . . . .	8-12-9	8-13-6	8-17-0	8-18-6	9-10-1	12-14-4	9-12-0	12-19-5
	Cottonseed cake (London) . . . . .	5-6-6	5-7-0	5-11-0	5-12-1	5-1-3	6-3-8	4-17-8	6-11-7
	Palm kernel cake (Liverpool) . . . . .	6-13-6	6-16-6	6-10-0	6-7-11	n. q.	8-3-0	5-9-2	8-8-4

ITALY (Prices in lire per quintal).

A I	Wheat, soft (Milan) . . . . .	118.65	115.75	110.00	99.35	105.45	133.10	111.80	131.45
	Wheat, hard (Palermo) . . . . .	138.00	136.00	135.00	131.00	130.00	145.30	135.00	141.00
	Oats (Milan) . . . . .	n. 76.50	76.50	76.50	73.40	73.50	82.80	74.30	82.20
	Maize (Milan) . . . . .	71.85	65.75	63.75	60.05	49.40	78.55	56.30	77.85
	Rice (Milan) . . . . .	147.83	145.75	147.25	136.20	109.65	173.15	125.55	181.20
	Hemp, fibre . . . . .	...	215.00	211.00 <sup>4</sup>	213.00	192.00	398.35	245.00	461.00
	Olive oil (Bari) (5) . . . . .	525.00	525.00	475.00	538.65	575.00	481.65	580.25	551.40
	Wine, ordinary, 11° to 13° (Bari) (hectol.) . . . . .	80.00	80.00	80.00	90.00	111.00	128.35	118.00	136.00

(1) Dec.: 89.00. — (2) Rectified price for Dec.: 723.00 — (3) Rectified price for Nov.: 2-15-0. — (4) Nov.: 210.00. — (5) New series.

		Average							
Groups	COUNTRIES AND PRODUCTS	March.	Feb.	Jan.	Oct.	Jan.	Jan.	Agricultural year	
		1932	1932	1932	Dec. 1931	March. 1932	March. 1930	1930-31	1929-30
ITALY (continued)									
A II	Cheese Parmigiano Reggiano (Milan)	987.00	975.00	975.00	1,017.00	1,104.00	1,133.00	1,139.00	1,128.00
	Eggs, fresh (Milan) (per 100)	29.50	34.50	43.60	60.00	41.75	44.40	47.00	52.15
	Beef, live weight (Milan)	302.00	337.00	332.00	314.00	381.00	470.00	404.00	480.00
	Pork, live weight (Milan)	377.00	355.00	350.00	357.00	414.00	633.00	444.00	637.00
B I	Basic slag 16-20 % (Chiasso) (2)	1.075	1.075	1.000	1.027	1.36	1.42	1.29	1.43
	Superphosphate, mineral, 15-17 % (Genoa) (2)	1.105	1.195	1.195	1.19	1.20	1.30	1.24	1.30
	Chloride of potassium (Genoa)	70.50	71.50	71.50	71.50	78.40	84.00	80.25	83.50
	Sulphate of ammonia (Genoa)	78.75	77.25	75.50	74.50	78.70	93.05	81.75	91.25
	Copper sulphate (Genoa)	126.50	130.00	130.00	137.65	176.35	231.65	182.00	223.00
B II	Wheat bran (Genoa)	47.10	46.40	52.70	51.30	42.30	55.80	45.00	58.00
	Rice bran (Milan)	45.00	45.00	45.00	39.75	35.00	57.30	38.00	57.00
	Linseed cake (Milan)	64.00	66.85	68.10	64.35	62.50	104.50	65.00	99.00
	Groundnut cake (Milan)	57.15	57.50	57.80	57.00	51.25	79.00	55.00	82.00
	Rapeseed cake (Milan)	40.00	37.50	34.50	32.50	32.25	69.10	37.00	66.00
NETHERLANDS (Prices in guilders per quintal).									
A I	Wheat (Groningen)	n. 12.50	n. 12.50	n. 12.50	n. 12.50	5.87	8.50	6.04	9.69
	Rye (Groningen)	5.10	4.77	5.17	4.76	4.01	5.60	4.40	6.72
	Barley (Groningen)	5.90	5.61	5.76	5.73	4.63	6.72	5.00	7.93
	Oats (Groningen)	6.20	5.67	6.08	5.65	4.65	5.03	5.30	6.16
	Peas (Rotterdam)	12.05	12.00	12.12	12.60	8.29	9.60	9.40	12.02
	Flax, fibre (Rotterdam)	54.50	55.00	53.50	56.50	61.30	98.15	61.00	100.00
	Potatoes (Amsterdam)	5.90	6.07	6.83	6.19	7.74	3.26	7.20	3.75
A II	Butter (Maastricht)	108.00	132.00	114.0	120.35	162.00	106.35	157.00	194.00
	Cheese, Gouda 45 % (Gouda)	54.24	61.25	57.50	69.43	79.37	97.05	83.00	100.84
	Cheese, Edam 40 % (Alkmaar)	51.74	59.00	55.25	52.67	68.37	88.40	74.44	90.09
	Eggs (Roermond) (per 100)	3.38	3.76	4.08	6.18	5.02	6.52	5.25	7.22
	Beef, dead weight (Rotterdam)	73.00	71.00	73.00	74.20	94.30	105.15	100.00	105.00
	Pork, live weight (Rotterdam)	27.50	29.50	34.00	41.00	44.80	77.30	49.00	79.00
B I	Basic slag (2)	0.102	0.104	0.102	0.103	0.149	0.162	0.144	0.16
	Superphosphate 17 %	2.00	1.95	1.85	2.22	2.60	3.24	2.68	3.15
	Kainit (2)	0.146	0.146	0.154	0.152	0.154	0.153	0.150	0.15
	Nitrate of soda	7.95	7.85	7.70	7.85	10.53	10.78	10.48	10.50
	Sulphate of ammonia 20 1/2 %	1.25	1.40	1.55	1.70	9.35	10.27	9.02	10.06
B II	Maize (Rotterdam)	4.36	3.72	3.58	4.39	4.58	7.23	5.43	8.54
	Linseed cake, Dutch	6.85	6.65	6.95	7.09	9.55	10.87	9.05	12.24
	Coconut cake	6.40	6.00	6.20	6.85	7.68	9.29	7.88	10.05
	Groundnut cake	7.60	7.30	7.30	7.40	7.07	9.94	7.43	10.95
POLAND (Prices in zlotys per quintal).									
A I	Wheat (Warsaw)	27.49	26.48	26.44	26.42	25.21	36.87	31.17	40 .
	Rye (Warsaw)	25.36	24.23	26.27	25.43	19.29	20.62	21.33	22 .
	Barley (Warsaw)	23.92	23.50	24.37	26.23	24.64	25.40	25.55	26 .
	Oats (Warsaw)	23.94	22.84	22.98	24.20	22.00	19.34	24.01	21 .
A II	Butter (Warsaw)	417.00	446.00	355.00	426.00	445.00	608.00	486.00	590.00
	Beef, live weight (Warsaw)	64.00	67.00	67.50	74.05	96.65	131.35	103.00	131.00
	Pork, live weight (Warsaw)	95.00	90.00	89.75	109.50	130.00	232.65	152.00	238.00
	Eggs (Warsaw) per 100)	10.76	11.34	13.03	14.10	15.00	14.86	14.25	16.30
B I	Superphosphate (2)	(3) 0.43	(3) 0.48	(3) 0.57	(3) 0.84	0.82	0.90	0.83	0.89
	Potash salts 25 %	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75
	Sulphate of ammonia	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
B II	Wheat bran (Warsaw)	15.50	15.70	15.40	15.73	15.50	14.75	16.52	16.64
	Rye bran (Warsaw)	14.37	14.20	13.70	15.82	18.10	11.10	14.15	18.34
	Linseed cake (Warsaw)	24.62	23.25	24.62	27.10	30.00	35.70	31.40	39.86
	Rapeseed cake (Warsaw)	18.44	18.62	20.12	19.80	19.50	27.40	21.90	29.85

(1) Rectified price for Dec. 1, 1932. — (2) Prices per unit contained in one quintal. — (3) Net price.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		March	Feb.	Jan.	Oct.-	Jan.-	Jan.-	1929-31	1929-30
		1932	1932	1932	Dec. 1931	March 1931	March 1930		

## SWEDEN (Prices in Swedish crowns per quintal)

A I	Wheat . . . . .	17.48	17.32	17.27	16.92	19.83	18.02	16.30	18.31
	Rye . . . . .	16.01	15.98	15.98	15.85	16.50	13.91	3.23	14.92
	Barley . . . . .	12.17	12.15	12.00	11.78	11.51	12.24	12.25	13.40
	Oats . . . . .	10.28	10.30	10.50	9.78	9.90	9.76	10.18	10.88
A II	Beef, live weight (Göteborg) . . . . .	31.00	34.00	37.00	40.67	40.00	55.00	53.00	56.00
	Pork, live weight (Göteborg) . . . . .	47.20	42.25	44.25	50.91	53.75	106.00	65.00	108.00
	Butter (Malmö) . . . . .	174.60	200.00	176.00	200.75	211.00	251.00	200.00	202.00
	Eggs (Stockholm) . . . . .	65.60	82.50	109.50	146.50	115.00	138.00	144.00	151.00
B I	Superphosphate, 20 % . . . . .	6.50	6.35	6.15	n. q.	7.78	7.80	7.48	7.85
	Potash salts, 20 % . . . . .	7.75	7.75	7.75	n. q.	7.95	8.10	7.92	8.25
	Chilisaipeter . . . . .	18.35	n. q.	n. q.	n. q.	19.04	19.04	18.59	19.38
	Calcium cyanamide . . . . .	15.50	15.50	n. q.	n. q.	18.10	18.10	18.10	18.40
B II	Maize, La Plata . . . . .	10.16	8.90	9.10	9.10	8.93	13.00	10.07	14.73
	Wheat bran . . . . .	10.61	9.90	10.14	9.55	10.00	9.92	9.55	11.12
	Groundnut cake . . . . .	16.25	15.75	15.72	14.82	13.37	17.12	13.52	18.42
	Cottonseed cake . . . . .	12.50	12.90	12.80	12.18	12.30	16.01	12.80	16.98
	Soya meal . . . . .	15.11	14.03	14.21	13.90	14.10	15.71	14.08	17.37

## CZECHOSLOVAKIA (Prices in Czech. crowns per quintal).

A I	Wheat . . . . .	150.00	145.00	149.50	116.30	145.30	173.70	149.00	172.00
	Rye . . . . .	143.50	140.50	149.50	150.15	101.50	112.70	108.00	121.00
	Barley . . . . .	103.00	111.50	118.00	121.80	141.30	125.00	134.00	138.00
	Oats . . . . .	110.00	112.00	100.00	115.30	114.30	105.80	118.00	117.00
	Edible potatoes . . . . .	27.50	27.50	20.50	24.65	35.30	35.00	41.00	37.00
	Hops . . . . .	515.00	515.00	565.00	687.00	785.00	1,573.00	98.00	1,496.00
A II	Butter . . . . .	2,150.00	1,925.00	2,000.00	1,983.00	2,250.00	2,117.00	2,170.00	2,150.00
	Fresh eggs (per 100) . . . . .	51.10	61.65	68.35	73.65	82.10	78.90	7.00	78.10
	Beef, dead weight . . . . .	775.00	775.00	775.00	875.00	979.00	1,142.00	98.00	115.00
	Veal, dead weight . . . . .	725.00	850.00	650.00	760.00	925.00	1,233.00	98.00	115.00
	Pork, dead weight . . . . .	912.50	875.00	835.00	920.00	904.00	1,404.00	1,01.00	115.00
B I	Basic slag, 15 % . . . . .	33.38	33.00	33.00	35.18	38.05	40.35	36.00	36.00
	Superphosphate, 16 to 18 % . . . . .	51.85	51.85	51.85	51.85	51.85	57.80	52.00	52.00
	Kaunit, 14 % . . . . .	22.80	21.15	21.15	21.71	24.00	23.90	23.00	23.00
	Chile salpeter . . . . .	147.00	145.50	145.50	142.00	165.50	170.50	165.15	165.15
	Sulphate of ammonia, 20 1/2 % . . . . .	127.75	127.75	127.75	124.42	140.00	140.00	138.66	138.66
B II	Maize, imported . . . . .	63.25	58.25	65.25	65.15	67.25	107.40	80.00	80.00
	Wheat bran (Prague) . . . . .	79.00	74.00	78.10	78.25	80.80	78.00	7.00	7.00
	Rye bran (Prague) . . . . .	80.00	75.00	79.00	80.30	79.65	71.90	75.00	75.00
	Crushed soya (Prague) . . . . .	111.60	110.50	115.00	115.60	n. q.	144.00	13.70	134.00
	Rapeseed cake (Prague) . . . . .	100.00	100.00	100.00	98.50	92.40	134.50	99.00	147.00
	Linseed cake (Prague) . . . . .	119.00	118.50	126.50	125.15	131.75	163.10	137.00	182.00
	Groundnut cake (Prague) . . . . .	117.25	n. q.	128.00	120.90	113.80	152.10	125.00	174.00

## THE PRICES OF AGRICULTURAL PRODUCTS DURING THE FIRST QUARTER OF 1932

In the following pages the index-numbers of prices of agricultural products and other price-indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled "Index-numbers of prices of agricultural products and other price-indices of interest to the farmer". We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilisation from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting formally to unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

It is only as a supplement to the figures published in the tables and with all the qualifications that have just been indicated that a table is given below, corresponding to those published at the end of each of the preceding quarters and containing the quarterly indices.

### *General index-numbers of prices of agricultural products*

(Base: the first quarter of 1929 = 100).

COUNTRIES	1930				1931			1932	
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	1st Quarter	1st Quarter
Germany . . .	87.1	83.2	86.4	83.1	79.9	81.4	77.5	73.0	70.9
England and Wales . . .	100.0	93.1	95.1	88.9	87.5	85.4	83.8	79.2	81.2
Belgium . . .	80.1	72.0	72.5	87.7	83.7	83.9	82.8	56.7	52.8
Finland . . .	82.2	77.6	76.6	69.2	69.2	66.7	64.5	67.3	72.6
Hungary . . .	68.7	61.9	61.9	59.7	60.4	62.4	64.2	66.4	67.2
Netetherlands . . .	82.3	77.3	75.4	80.5	63.7	65.1	61.4	62.4	64.5
Poland . . .	89.3	84.6	89.4	78.9	77.1	78.2	70.7	61.1	57.9
Argentina . . .	78.4	76.3	75.0	70.9	64.0	71.4	68.4	63.3	58.7
Canada . . .	89.5	85.2	83.1	66.4	59.7	59.5	59.5	63.1	58.5
United States Bureau of Agric. Economics . . .	99.7	92.6	75.8	66.6	61.9	60.2	55.6	55.8	53.2
United States Bureau of Labor . . .	95.6	91.9	80.9	75.0	67.5	63.7	56.4	50.2	44.0
New Zealand . . .	92.8	87.8	79.5	74.5	67.8	63.7	59.3	54.4	48.8
	80.5	77.4	75.3	64.1	57.4	56.7	50.6	49.3	51.4

# **INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER \***

COUNTRIES AND CLASSIFICATION	March	Febr.	Jan.	Dec.	Nov.	Oct.	March	March	Year	
	1932	1932	1932	1931	1931	1931	1931	1930	1931	1930
<b>GERMANY</b> (Statistisches Reichsamt) 1913 = 100.										
Foodstuffs of vegetable origin . . . . .	121.6	119.5	115.3	112.8	115.6	112.5	121.0	109.0	119.3	115.3
Livestock . . . . .	65.6	65.7	65.7	68.4	71.4	76.9	96.7	115.8	83.0	112.4
Livestock products . . . . .	97.6	95.5	92.1	101.1	107.4	106.7	113.0	117.7	108.4	121.7
Feeding stuffs . . . . .	99.0	93.5	92.0	93.6	98.7	95.5	102.7	85.8	101.0	93.2
Total agricultural products . . . . .	96.5	94.6	92.1	94.5	98.5	98.5	106.7	110.0	103.8	113.1
Fertilizers . . . . .	72.2	72.0	71.3	70.4	72.1	74.0	82.7	86.1	76.5	82.4
Agricultural dead stock . . . . .	117.2	118.9	122.6	128.3	128.6	120.5	132.4	140.8	130.7	139.4
Finished manufactures ("Gebrauchs- güter") . . . . .	12.15	123.6	126.9	132.4	134.2	135.8	143.6	163.3	140.1	150.3
General index-number . . . . .	99.8	99.8	100.0	103.7	106.6	107.1	113.9	120.4	110.0	124.6
<b>ENGLAND AND WALES</b> (Ministry of Agriculture) Average of corresponding months 1911-13 = 100.										
Agricultural products . . . . .	113	117	122	117	112	113	123	139	120	134
Feeding stuffs . . . . .	102	97	95	93	97	88	85	101	83	96
Fertilizers . . . . .	91	91	91	91	90	89	100	102	96	101
General index-number (1). . . . .	...	102.0	99.6	100.5	97.6	96.3	100.6	121.2	97.7	114.1
<b>ARGENTINA (2)</b> (Banco de la Nación Argentina) 1926 = 100.										
Cereals and linseed . . . . .	63.1	59.1	55.3	53.2	65.6	63.3	53.2	91.0	55.8	82.3
Meat . . . . .	70.5	72.3	72.2	77.1	84.8	90.8	94.4	112.8	91.6	110.0
Hides and skins . . . . .	61.6	61.8	62.7	59.1	66.3	61.5	70.1	75.3	64.5	71.6
Wool . . . . .	48.7	49.4	49.1	51.7	53.0	60.3	64.5	71.9	61.2	67.4
Dairy products . . . . .	58.8	58.9	58.8	60.6	70.7	74.2	74.3	94.9	74.5	82.4
Forest products . . . . .	78.3	78.3	79.3	80.5	81.7	83.5	108.7	106.8	99.3	107.9
Total agricultural products . . . . .	63.3	61.0	58.9	61.4	63.6	67.7	63.2	92.4	63.3	85.5
<b>CANADA (2)</b> (Internal Trade Branch of the Dominion Bureau of Statistics) 1926 = 100.										
Field products (grain, etc.) . . . . .	43.7	43.7	42.0	42.2	46.0	44.0	44.1	78.4	44.6	70.0
Animals and animal products . . . . .	65.2	66.2	68.8	71.1	72.1	72.1	84.7	112.3	77.6	102.9
Total Canadian farm products . . . . .	51.7	52.1	52.0	53.0	55.8	54.5	59.3	91.1	57.0	82.3
Fertilizers . . . . .	72.0	72.0	71.0	71.1	75.5	75.5	86.5	83.7	83.0	88.2
Consumer's goods (other than foodstuffs etc.) . . . . .	78.0	79.7	79.3	79.9	79.3	79.9	81.4	88.7	80.5	86.3
General index-number . . . . .	69.1	69.2	69.4	70.3	70.6	70.4	75.1	91.8	72.6	86.6
<b>ESTONIA</b> (Central Bureau of Statistics) 1913 = 100.										
Commodities imported (3). . . . .	113	112	117	125	124	127	120	113	129	118
Commodities exported . . . . .	68	64	60	64	70	70	84	110	78	103
Agricultural products imported and exported (3) . . . . .	81	78	76	81	85	86	95	111	91	103

\* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930), as well as to pages 77 to 79 of the "Crop Report" of January 1932.

(1) Calculated by the "Statist", reduced to base-year 1913 = 100. — (2) Average data for the year 1931 are provisional. — (3) From January 1932 the price of rye is excluded from the calculations.

COUNTRIES AND CLASSIFICATION	March	Febr.	Jan.	Dec.	Nov.	Oct.	March	March	Year	
	1932	1932	1932	1931	1931	1931	1931	1930	1931	1930
<b>UNITED STATES</b> (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals . . . . .	51	51	52	52	57	46	74	107	63	100
Fruits and vegetables . . . . .	73	68	70	68	68	70	109	100	98	158
Meat animals . . . . .	69	65	68	68	70	70	106	151	93	134
Dairy products . . . . .	76	79	85	92	95	95	101	126	94	123
Poultry and poultry products . . . . .	61	70	87	120	123	110	92	115	95	126
Cotton and cottonseed . . . . .	50	47	45	45	50	42	80	113	63	102
Total agricultural products . . . . .	61	60	63	66	71	68	91	126	80	117
Commodities purchased by farmers (1) . . . . .	...	...	121	123	123	126	136	151	129	146
Agricultural wages (1) . . . . .	94	—	98	—	—	113	(2) 127	(2) 162	116	152
<b>UNITED STATES</b> (Bureau of Labor) 1926 = 100.										
Grains . . . . .	43.5	46.1	46.7	47.0	51.3	44.3	59.8	83.5	58.0	58.3
Livestock and poultry . . . . .	51.4	50.3	53.4	51.7	55.7	57.6	70.7	99.6	63.9	59.2
Other farm products . . . . .	52.1	52.7	54.8	61.2	63.1	64.2	74.2	95.2	69.2	91.1
Total farm products . . . . .	50.2	50.6	52.8	55.7	58.7	58.8	70.6	94.7	64.8	83.3
Agricultural implements . . . . .	85.0	85.1	85.5	92.1	92.1	92.3	94.7	95.0	94.0	95.1
Fertilizer materials . . . . .	68.6	69.8	69.9	70.1	70.1	70.2	80.8	88.2	76.8	85.6
Mixed fertilizers . . . . .	73.2	73.7	75.5	77.1	77.7	77.2	88.3	94.8	82.0	93.6
Cattle feed . . . . .	52.4	48.2	53.0	53.9	59.8	49.4	82.1	103.8	62.7	99.7
Non-agricultural commodities . . . . .	60.3	60.6	70.3	69.3	71.0	71.2	75.7	89.8	73.0	85.9
General index-number . . . . .	66.0	66.3	67.3	66.3	68.3	68.4	74.5	90.8	71.1	86.3
<b>FINLAND</b> (Central Bureau of Statistics) 1926 = 100.										
Cereals . . . . .	92	94	96	93	81	73	74	81	77	76
Potatoes . . . . .	69	68	68	54	49	49	73	101	68	76
Fodder . . . . .	70	71	73	71	62	53	70	63	63	62
Meat . . . . .	67	63	57	57	51	54	73	101	64	88
Dairy products . . . . .	78	84	90	92	88	77	74	86	76	84
Total agricultural products . . . . .	77	78	78	78	72	67	75	88	72	82
General index-number . . . . .	92	93	94	92	87	82	86	92	84	90
<b>HUNGARY</b> (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products . . . . .	92	90	89	89	89	88	84	88	—	—
General index-number . . . . .	99	99	98	99	99	97	94	100	—	—
<b>ITALY</b> (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products . . . . .	351.62	349.57	350.71	342.35	336.84	337.20	345.90	438.07	343.11	413.39
General index-number . . . . .	322.14	323.49	325.92	325.54	328.74	329.35	356.18	436.49	341.57	411.04
<b>NEW ZEALAND</b> (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce . . . . .	...	90.8	91.5	91.5	102.6	106.9	104.3	129.0	99.3	120.7
Meat . . . . .	...	118.5	122.8	137.8	113.1	119.6	125.4	172.8	129.2	164.7
Wool . . . . .	...	64.9	66.8	61.7	66.2	61.8	60.3	88.8	67.7	100.7
Hides, skins, and tallow . . . . .	...	75.1	72.1	67.0	67.9	60.0	78.4	173.2	82.7	145.4
Miscellaneous . . . . .	...	188.0	112.3	135.8	93.1	122.1	144.0	141.5	127.4	134.0
Total agricultural products . . . . .	...	86.4	85.0	94.8	97.3	101.2	95.1	133.1	96.8	123.7

(1) 1910-14 = 100. — (2) April.

COUNTRIES AND CLASSIFICATION	March	Febr.	Jan.	Dec.	Nov.	Oct.	March	March	Year	
	1932	1932	1932	1931	1931	1931	1931	1930	1931	1930
<b>NORWAY</b> (Kgl. Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals . . . . .	123	122	123	110	110	106	104	128	(1) 112	(1) 114
Potatoes . . . . .	150	140	137	126	119	109	181	120	(1) 150	(1) 152
Pork . . . . .	88	93	95	90	88	92	81	127	(1) 86	(1) 68
Other meat . . . . .	119	120	113	126	121	127	172	204	(1) 138	(1) 138
Eggs . . . . .	81	87	90	114	132	126	124	99	(1) 96	(1) 121
Dairy products . . . . .	123	130	129	136	133	131	135	148	(1) 129	(1) 150
Concentrated feeding stuffs . . . . .	106	108	109	108	102	97	108	128	(1) 103	(1) 117
Maize . . . . .	87	83	86	85	81	73	83	116	(1) 82	(1) 103
Fertilizers . . . . .	89	91	91	86	86	81	96	106	(1) 90	(1) 101
<b>NETHERLANDS</b> (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil . . . . .	56	60	58	57	59	58	71	51	(2) 72	(3) 68
Animal products . . . . .	51	54	53	53	57	58	74	38	(2) 77	(2) 95
Total agricultural products . . . . .	52	55	54	54	58	58	73	80	(2) 76	(2) 88
Agricultural wages . . . . .	95	95	95	95	95	95	100	100	(2) 99	(4) 100
General index-number (3) . . . . .	...	56.2	56.8	57.4	60.2	60.2	60.7	82.5	65.7	79.2
<b>POLAND (4)</b> (Central Bureau of Statistics) 1927 = 100.										
Products of the soil . . . . .	57.1	53.8	52.7	58.0	59.1	51.0	50.8	52.9	53.0	52.
Products of agricultural industry . . . . .	67.1	61.5	62.6	66.2	68.7	61.8	63.4	70.7	65.9	69.
Total products of plant origin . . . . .	62.3	59.3	57.8	62.4	64.2	56.6	57.1	61.3	60.0	60.5
Animals . . . . .	30.6	37.8	37.5	41.3	43.7	47.5	58.0	89.8	55.8	82.
Dairy products . . . . .	53.7	68.5	56.0	68.0	76.9	66.3	74.0	78.9	68.0	81.
Total products of animal origin . . . . .	45.6	49.5	45.4	51.8	56.4	55.3	64.8	84.9	60.8	81.
Total agricultural products . . . . .	54.1	54.5	51.8	57.2	60.3	55.6	59.8	70.1	59.7	68.5
Fertilizers . . . . .	94.1	94.1	108.4	108.4	118.5	118.5	124.7	130.6	120.2	127.8
Industrial products . . . . .	72.2	73.0	74.4	74.0	74.5	76.3	83.4	97.5	79.4	94.0
General index-number . . . . .	64.0	64.6	63.9	66.4	68.2	66.3	72.5	85.0	70.5	82.3
<b>YUGOSLAVIA</b> (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil . . . . .	78.0	70.3	69.0	70.6	70.9	71.1	73.3	95.9	74.3	89.3
Animal products . . . . .	55.0	57.6	60.5	58.6	63.6	66.1	77.4	102.5	72.2	96.3
Industrial products . . . . .	68.3	68.8	69.2	68.5	68.7	69.3	72.6	83.6	71.4	81.8
General index-number . . . . .	67.8	67.3	67.8	67.2	68.6	69.5	74.6	91.1	72.9	86.6

(1) Agricultural year April 1-March 31. — (2) Agricultural year July 1-June 30. — (3) Calculated by the Central Statistics Bureau of the Netherlands, reduced to the base 1925-1929 = 100. — (4) Average data for the year 1931 are provisional.



## RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	April 15, 1932	April 8, 1932	April 1, 1932	March 24, 1932	Average			
	March 1932	April 1932	April 1932	March 1932	March 1932	April 1932	April 1932	Commercial Season
								1930-31 1929-30
SHIPMENTS OF WHEAT AND MAIZE.								
Danube to Antwerp/Hamburg . . . . . (shill. per 2240 lbs.)	14/6	14/6	14/6	n. q.	14/7	13/6	14/8	13/11 15/8
Black Sea to Antwerp/Hamburg . . . . .	10/6	10/6	11/-	n. q.	n 11/6	10/5	n. q.	10/10 n. q.
St. John to Liverpool (1) . . . . .	1/9	1/9	1/9	1/6	1/7 1/2	n. q.	1/6	1/6 1/5
Montreal to United Kingdom . . . . . (shill. per 480 lbs.)	(2) 0.08 1/2	(2) 0.09	(2) 0.08 1/2	(2) 0.09	(2) 0.09	2/-	2/-	1/10 1/10
Gulf to United Kingdom . . . . .	(1) 2/6	(1) 2/9	(2) 0.10 1/2	n. 2/9	(2) 0.10 1/2	(1) 2/-	2/3	2/3 2/6
New York to Liverpool (1) . . . . .	1/9-	1/9	1/9	1/9	1/8	1/7 1/2	1/6	1/6 1/6
Northern Range to U.K. and Continent	n. q.	n. q.	(2) 0.08 1/2	n. q.	(2) 0.08 1/2	1/8 1/2	1/9	1/9 1/9
North Pacific to United Kingdom (sh. per 2240 lbs.)	21/-	22/6	23/6	24/-	23/11	21/1 1/2	19/7	22/3 22/7
Vancouver to Yokohama (1) (gold \$ per sh. ton) . .	2.20	2.20	2.20	2.35	2.35	2.75	2.50	2.72 2.78
La Plata Down River (3) to U. K./Continent . . . . .	16/0	16/-	n. 15/6	16/-	16/11	17/3	12/4	16/4 12/8
La Plata Up River (4) to U. K./Continent . . . . . (shill. per 2240 lbs.)	18/3	17/6	17/-	n. 17/6	18/6	18/9	14/6	18/- 14/4
Karachi to U. K./Continent (5) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	19/7 1/2	n. q.	19/3 n. 15/4
Western Australia to U.K./Continent . . . . .	26/9	27/3	27/7	28/-	28/7	28/6	23/9	29/8 25/7
SHIPMENTS OF RICE.								
								1931 1930
Saigon to Europe . . . . . (shill. per 2240 lbs.)	n. q.	n. 23/9	23/9	n. q.	(1) 22/4	(1) 24/6	(1) 16/4	24/3 n. 18/11
Burma to U.K./Continent . . . . .	(1) 27/6	n. 25/9	25/9	n. 25/6	n. 25/6	23/1	17/4	23/9 n. 17/8

(1) Rates for parcels by liners. — (2) Freight in gold \$ per 100 lbs. — (3) "Down River", includes the ports Buenos Aires and La Plata. — (4) "Up River" includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight. — (5) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs.

## EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	April 15, 1932	April 8, 1932	April 1, 1932	March 24, 1932
Germany . . . . .	Berlin	— 0.4	— 0.4	— 0.4	— 0.4
Argentina . . . . .	New York	— 39.3	— 39.3	— 39.3	— 39.3
Belgium . . . . .	Brussels	+ 0.0	+ 0.0	+ 0.6	+ 0.2
Canada . . . . .	New York	— 9.9	— 9.5	— 9.9	— 10.5
Denmark . . . . .	Copenhagen	— 23.0	— 23.0	— 22.4	— 24.7
Egypt . . . . .	London	— 22.5	— 22.3	— 21.7	— 24.1
France . . . . .	Paris	+ 0.7	+ 0.7	+ 0.5	+ 0.1
Great Britain . . . . .	London	— 22.5	— 22.3	— 21.7	— 24.1
Hungary . . . . .	Budapest	— 0.0	— 0.0	— 0.0	— 0.0
India . . . . .	London	— 22.2	— 21.9	— 21.4	— 23.4
Indo-China . . . . .	Paris	+ 0.7	+ 0.7	+ 0.5	+ 0.1
Italy . . . . .	Milan	— 2.0	— 1.8	— 1.6	— 1.8
Japan . . . . .	New York	— 33.2	— 33.2	— 33.6	— 34.6
Netherlands . . . . .	Amsterdam	+ 0.8	+ 0.8	+ 0.5	+ 0.1
Rumania . . . . .	New York	— 0.0	— 0.0	— 0.0	— 0.2

(1) The percentage represents the premium or the loss as far as possible on the national exchange. On page 228 may be found the table of reciprocal parities of the currencies considered; by the aid of this table and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Crop Report refer.

RECIPROCAL PARTIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN  
THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	Canada	United States	Denmark	Egypt	France	Indo China	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Rumania	Czechoslovakia	Former Latin monetary union (3)
Germany . . . . .	Reichsmark	1	0.561	8.566	0.238	0.889	4.810	6.080	0.979	1.362	0.653	4.526	0.478	0.503	2.123	39.825	8.040	1.235		
Argentina . . . . .	Paper peso	1.782	1	15.268	0.424	1.584	8.586	10.838	1.744	2.427	1.163	8.064	0.831	1.056	3.872	70.959	14.326	2.200		
Belgium . . . . .	Franc	0.117	0.065	1	0.028	0.104	0.563	0.710	0.114	0.159	0.076	0.528	0.056	0.069	0.248	4.640	0.980	0.145		
Canada . . . . .	Dollar	4.198	2.356	35.959	1	3.731	20.230	25.524	4.110	5.718	2.740	19.000	2.006	2.488	8.914	167.181	33.751	5.183		
United States . . . . .																				
Denmark . . . . .	Crown	1.125	0.081	9.087	0.268	1	5.422	6.840	1.101	1.532	0.734	5.092	0.538	0.667	2.389	44.803	9.045	1.389		
Sweden . . . . .	Plastre	0.207	0.016	1.777	0.049	0.184	1	1.262	0.203	0.233	0.135	0.938	0.099	0.123	0.441	8.264	1.068	0.256		
Egypt . . . . .	Franc																			
France . . . . .	Franc	0.164	0.092	1.409	0.039	0.146	0.793	1	0.161	0.224	0.107	0.744	0.079	0.097	0.349	6.550	1.322	0.208		
Indo-China . . . . .	Piastre (2)																			
Great Britain . . . . .	Shilling	1.021	0.573	8.750	0.243	0.998	4.923	6.211	1	1.391	0.667	4.623	0.488	0.605	2.169	40.680	8.213	1.261		
Hungary . . . . .	Pengö	0.734	0.412	6.288	0.175	0.653	3.590	4.464	0.720	1	0.479	3.323	0.351	0.435	1.559	29.240	5.903	0.906		
India . . . . .	Rupce	1.532	0.860	13.125	0.365	1.362	7.334	9.316	1.500	2.087	1	6.935	0.782	0.908	3.254	61.020	12.319	1.892		
Italy . . . . .	Lira	0.221	0.124	1.892	0.053	0.196	1.065	1.343	0.216	0.301	0.144	1	0.106	0.131	0.469	8.799	1.776	0.278		
Japan . . . . .	Yen	2.092	1.174	17.924	0.498	1.860	10.054	12.723	2.049	2.850	1.399	9.471	1	1.240	4.443	83.383	16.824	2.588		
Netherlands . . . . .	Florin	1.687	0.947	14.454	0.402	1.450	8.132	10.260	1.652	2.298	1.101	7.637	0.506	1	3.533	67.200	13.567	2.088		
Poland . . . . .	Zloty	0.471	0.264	4.034	0.112	0.419	2.579	2.863	0.461	0.641	0.307	2.131	0.225	0.279	1	18.755	3.786	0.581		
Rumania . . . . .	Leu	0.025	0.014	0.215	0.006	0.022	0.121	0.153	0.025	0.034	0.016	0.114	0.012	0.015	0.053	1	0.202	0.031		
Czechoslovakia . . . . .	Crown	0.124	0.070	1.065	0.030	0.111	0.599	0.756	0.122	0.169	0.081	0.563	0.059	0.074	0.264	4.953	1	0.154		
Former Latin monetary union (3) . . . . .	Gold Franc	0.810	0.455	6.638	0.193	0.720	3.903	4.925	0.793	1.103	0.529	3.666	0.387	0.480	1.720	32.258	6.512	1		

(1) Each figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) 1 Gold piastre equal to 10 francs. — (3) Data for purpose of comparison.

# MONTHLY CROP REPORT

## AND AGRICULTURAL STATISTICS

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The following notes refer to crop conditions quoted in the crop reports and in the tables: — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.

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1932

No. 5

### THE SITUATION ON THE WHEAT MARKET AND PROSPECTS FOR PRODUCTION

The fluctuations in prices during April and the first half of May were of weak amplitude; the market, which showed an upward tendency after the forecast made in April of a poor crop of hard winter wheat in the United States, subsequently weakened and dropped again to its level in March remaining there in the first half of May.

On the basis of the statistical situation in the present season which is, *gross modo*, well defined, the carry-over to the coming season will undoubtedly also be very heavy this year.

The estimate of the quantities available for export has not been changed since our last calculation (1) which placed them at 1,338 million bushels. Exports in the first eight months of the season amounted to about 533 million bushels and consequently the exportable surplus on April 1 was 805 million bushels, of which about 3/4 was held in North America and practically the whole of the remainder was in Argentina, in Australia or afloat. World wheat exports since the beginning of the season, calculated by totalling the net exports of all the exporting countries to the end of March, were as follows, in millions of bushels: August 74; September 82; October 74; November 75; December 62; January 56; February 62 and March 66, giving a total of 551 million bushels. Taking into account the changes which have taken place in the quantities of foreign wheat in bond in Canada and the United States and also in the quantities afloat, this total is reduced to 533 million bushels. According to the customs statistics of the various European importing countries, imports into Europe in the eight months amounted to 375 million bushels and consequently those of the non-European countries calculated approximately by difference are 158 million bushels. The requirements of the importing countries for the whole season have been forecast in this publication at 880 million bushels: 624 for Europe and 256 for the other continents. As regards Europe, it seems probable that the figure forecast will be attained. Of the 624 million, 374 having been imported during the eight months, there remain to be imported 250 during the period April 1 to July 31. Last year imports during these four months reached 220 million out of a total of 606; it is probable that the requirements of the European countries in the last four months of the season will, this year, be a little larger than those of last year, requirements for con-

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(1) See Crop Report, March 1932.

sumption having been assured during the beginning of the season in a larger proportion than usual by the home production marketing of which, in this period, was relatively larger. As regards the non-European countries, the total of 158 million imported in the first eight months permits the forecast that the total for the season will hardly deviate from the 256 million anticipated. Even if the total world requirements do not quite reach the 880 million bushels forecast, it appears that the difference can only, at the most, be a few millions of bushels, so that the stocks to be carried over to the season 1932-33 should, on August 1 next, be about 460 million bushels. Stocks on August 1 in recent years have been : 251 million bushels in 1927 ; 309 in 1928 ; 536 in 1929 ; 468 in 1930 and 546 in 1931.

\* \*

With regard to crop prospects in the coming season, the information available on the areas sown to wheat and on crop conditions at the beginning of May, may be summarised as follows :

*Areas sown :* As regards the areas sown to winter wheat, fairly complete data are possessed referring to about 90 % of the total area destined to this crop in the world excluding the U. S. S. R. and China.

In Europe, the area has remained practically the same as in 1931, the slight increases recorded in Germany, France and Italy having compensated for the decreases which have taken place in Poland, Rumania and Spain. In India an increase of nearly 2 ½ million acres has been made whereas in the United States it is anticipated that, owing especially to the serious winter damage, the winter wheat acreage for harvest will be smaller by about 9 million acres than that of 1931. In French North Africa, the sowings are equal in acreage to those of 1931. The data available are summarised in the following table.

*Areas sown to winter wheat.*

	1932	1931
	(million acres)	
Europe (1) . . . . .	61	61
Canada and the United States . . . . .	33	42
India and Syria . . . . .	35	33
French North Africa . . . . .	8	8
	137	144

On the basis of these incomplete data there is apparently a decrease for winter wheat of about 7 million acres compared with 1931. It is probable that the knowledge of the estimates of the wheat areas in the other countries will bring about practically no change in this estimate of the decrease in the winter acreage as in most of the countries considered, the unknown areas of sowings show, from one year to another, only small variations which, in general, are compensatory.

Concerning the spring crops, it is anticipated on the basis of farmers' reported intentions, that there will take place in the United States an increase of 7 million acres compared with the area harvested last year. It must be observed that the latter area was one of the smallest recorded in the United States in recent years owing to the severe

(1) The figures refer to 12 countries cultivating nearly 4/5 of the total wheat area of Europe.

drought which caused very considerable loss of sowings and constituted a quite exceptional case as regards the spring crop. In Canada, the reported intentions of farmers indicate, on the contrary, a decrease of nearly a million acres. The spring wheat crop in North America should therefore be increased by 6 million acres.

Some fairly important increases seem probable also in the two large exporting countries of the southern hemisphere where sowing will shortly be in full swing. According to information cabled quite recently to the Institute by the respective Governments, an increase of about a million acres is forecast for Australia and of 1.7 million for Argentina. There must therefore be taken into consideration an increase for the two countries of slightly less than 3 million acres.

Taking into account this various information, the changes in the wheat areas to be harvested in 1932 may be calculated, again in a largely approximate manner, as follows:

*Increase or decrease in the wheat areas estimated to be harvested in 1932 compared with 1931.*

(million acres).

Europe . . . . .	0
United States . . . . .	— 2
Canada . . . . .	— 1
India . . . . .	+ 3
Argentina and Australia . . . . .	+ 3
Other countries . . . . .	0
	— — —
	+ 3

These figures indicate a slight increase of 3 million acres in the total wheat area on last year's figure. They do not take into account, however, the crop of the U. S. S. R. In the latter country, the area sown to winter wheat has been increased by over 3 million acres compared with 1931 and that sown to spring wheat, according to the five year plan, by one million acres.

In conclusion, if the intentions to plant of spring wheat producers of the northern hemisphere and of the southern hemisphere are integrally realised, it seems probable that there will take place, for the whole world, an increase in the areas sown and that the latter may at present be estimated at about 7 million acres.

*The condition of crops at the beginning of May.* — In Europe, in general very mild winter conditions were followed in March and April by a spell of very cold weather which aroused fears of large losses of sowings, especially in the central-eastern region of Europe, where the fields were exposed to late frosts without an adequate protective snow cover. The news at present possessed on damage done in this period is somewhat better than was expected. In Germany, for example, loss of sowings varies from  $\frac{1}{2}$  to 1 % for the different cereals whereas last year it varied from 3 to 4 % ; in Poland it is estimated at about 3 %, for wheat and rye or nearly half that of last year.

The abnormal prolongation of the winter until the end of April gave rise to a considerable delay to growth which was the dominant feature of the crop situation in all European countries at the beginning of May. Although backward, the crops yet appear to be healthy and strong in most countries and their condition on May 1 was in general a little better than at the same period of last year.

The sunny, warm weather which prevailed in the first half of May in most of Europe was certainly beneficial to the crops which everywhere needed such conditions, but there

was, on the contrary, a continuation of cold weather, rains and storms in France where a very dry winter was followed by cold and very rainy weather in April.

The results of crops in Europe will still largely depend on weather conditions during the next two months. In the southern regions, to assure a good crop, a slow, gradual transition from spring to summer and the absence of excessive heat will be necessary in order to avoid the hastened ripening which is normally responsible for greater losses of production. In the northern areas, on the contrary, more sunshine and temperatures above the normal will be required. If these conditions are obtained hopes may still be entertained, for Europe as a whole, of an excellent crop or even one larger than the very abundant production of last year. The spring sowings which, it is true, are of only small importance as regards wheat, were effected under fairly satisfactory conditions but they are also greatly in delay in all European countries.

In the United States the crop condition of winter wheat at the beginning of May remained bad and a very poor crop was in prospect. As a result of more favourable weather conditions, however, a slight improvement took place in the crop situation in the first half of May, except in the western part of Kansas where conditions continue to be bad. Spring sowings have been made in Canada and the United States under conditions much more favourable than last year, the soil having had good moisture reserves, one of the most important factors for the successful growth of spring wheat.

The crop in British India, already largely harvested, is, according to the first estimate, about equal to that of 1931. In the Punjab, however, which produces over a third of the wheat of India, the first estimate has been reduced by 8 million bushels and in consequence it is very probable that the second estimate for all-India will also show a slight decrease (1).

In North Africa the situation varies according as the spring rains were timely or not. Drought and frost have damaged the crops in Algeria; where a production under the average is expected, but the rains at the end of April somewhat improved the situation. In Tunisia, Morocco and Egypt the crop is abundant; the small production of Cyrenaica has, however, been destroyed by the prolonged drought. The total production of North Africa is in consequence somewhat larger than in 1931.

New seedings in the southern hemisphere have made a good start.

Though the results of the season remain to a great extent dependent on the course of the season during the period still to elapse before harvest, the present situation may probably be summarised as follows. The areas to be harvested next summer are estimated to be approximately equal to those of 1931 for the countries of the northern hemisphere as a whole, excluding the U. S. S. R. Sowings in the U. S. S. R. show an increase in the wheat area of almost four million acres. An increase of three million acres is probable in the southern hemisphere. There will thus be for the world as a whole an increase in the wheat area of seven million acres.

Crop prospects, which are bad for winter wheat in the United States, are good for spring crops both in the United States and Canada; in Europe and North Africa they are on the whole fairly good and in any case better than at the same date last year; in India the crop is estimated to be slightly smaller than that of last year. In the U. S. S. R. the condition of winter wheat appears fairly good, while spring wheat seedings are less satisfactory.

Apart from seriously adverse circumstances from now until the time of harvest, prospects point to a larger world production in 1932 than in 1931.

G. 'CAPONE.

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(1) At the last moment there has been received the second estimate of wheat production in India of 204.6 million centals (340.9 million bushels) which shows a decrease of 2.6 (4.4) compared with the corresponding estimate for 1931.

## CEREALS

*Germany* : The predominantly cold weather in the first half of April greatly retarded the growth of the plants which recovered vigorously, however, under the influence of warmer weather at the end of the month. The early winter cereal sowings are in satisfactory condition but the later ones are a little late in growth.

Spring work was begun with some delay due to the persistence of winter conditions. Average abandonment expressed as a percentage of the area sown is as follows: 1.0 (against 3.8 last year) for winter wheat; 0.5 (3.0) for winter rye; 0.5 (3.5) for winter barley; 0.9 (3.1) for winter spelt.

At the beginning of May, the crop condition of winter spelt according to the system of the country, was 2.7 against 3.1 at the beginning of April 1932 and 2.8 at the beginning of May 1931.

*Austria* : The southern humid foehn winds in the last few days of March were followed by sporadic summer temperatures in the first week of April; at the beginning of the second week of the latter month temperatures again fell considerably and there was some snowfall in the mountains. Although the sky was very cloudy, temperatures remained low with night frosts in the more elevated regions.

There was no rain until after the middle of April and then there was not enough to sufficiently moisten the soil. In the last ten days of the month the weather turned fine with warm days but rather cold nights.

In April, winter cereals suffered principally from lack of warmth. The cold weather at the middle of the month almost completely checked their growth and it was not until towards the end of the month that they began to grow under more satisfactory conditions, the plants still remaining, however, short and not very uniform.

Work for the spring cereal sowings which were begun late this year, were interrupted towards the middle of April. Sowing was consequently considerably delayed and, at the beginning of May, was still in progress at the borders of the plains. In the last few days of April the weather was more favourable and the spring sowings had begun to sprout satisfactorily.

*Belgium* : In the first half of April abundant rains brought the moisture that was needed. Throughout the month temperatures were low with fairly severe night frosts. These unfavourable conditions seriously checked growth as well as field operations.

Winter cereals generally lack height but their condition is very satisfactory. Spring sowings, which were late, are sprouting slowly.

A slight extension of oats is expected.

*Bulgaria* : Towards the end of April cold and rainy weather delayed the growth of winter cereals. These unfavourable conditions also delayed spring sowings, which, however, are nearing completion. In some districts damage by floods is reported.

*Estonia* : At the beginning of May tillage for the spring cereal sowings had begun.

*Irish Free State* : Though the weather during April was harsh and cold, early-sown crops germinated well and braided evenly.

*France* : The period from 15 April to 15 May was marked by an average temperature below normal; with night frosts and in places snow, a lack of insolation and an excess of humidity. Growth of cereals was very much slackened and is two to three weeks late according to district; even in the south it is expected that the harvest will be at least a fortnight late. So far wheat does not seem to have suffered but spring





COUNTRIES	AREA SOWN					CROP CONDITION (†)								
	1931-32	1930-31	Average 1925-26 to 1929-30	% 1931-32		I-V-1932			I-IV-1931			I-V-1931		
				1930-31	Aver. = 100									
						Thousand acres					= 100	= 100	a)	b)
Canada (3) . . w)	408	599	705	88.2	70.7	—	—	94	—	—	—	—	—	86
United States 3) w)	3,281	3,143	3,480	104.4	94.8	—	—	83.2	—	—	79.0	—	—	85.4
Total America . .	3,779	3,742	4,165	101.1	90.8	—	—	—	—	—	—	—	—	—
French Morocco . .	2	2	2	9.5	105.3	—	—	—	—	—	—	—	—	—
Grand Total . {m}	37,922	37,850	38,984	100.2	97.3	—	—	—	—	—	—	—	—	—
{n}	102,687	107,203	108,211	95.8	94.9	—	—	—	—	—	—	—	—	—
BARLEY.														
Germany . . . w)	583	561	444	103.9	131.4	2.8	—	—	—	—	3.1	2.9	—	—
*Austria . . . {w)	...	18	23	...	...	2.8	—	—	2.9	—	—	2.8	—	—
{s)	...	404	364	...	...	2.4	—	—	—	—	—	2.3	—	—
Belgium . . . w)	78	70	73	111.2	106.6	...	...	...	—	—	—	—	—	95
Bulgaria . . . .	489	483	460	101.3	106.4	e)	—	—	e)	—	—	d)	—	—
Spain . . . . .	4,553	4,543	4,481	100.2	101.6	—	—	—	—	—	—	—	—	—
France . . . . .	432	466	410	92.9	105.6	—	—	—	—	—	—	—	—	—
Luxemburg . . . .	10	11	9	89.9	114.1	2.4	—	—	2.8	—	—	2.6	—	—
*Netherlands . . .	...	71	71	...	...	74	—	—	—	—	—	66	—	—
Poland . . . . w)	125	128	175	97.9	71.7	...	...	...	(2) 2.9	—	(2) 3.0	—	—	—
*Rumania . . . . .	245	248	—	98.7	...	...	...	(e)	—	—	f)	—	—	—
Switzerland . . . .	18	18	16	100.0	110.0	—	—	98	—	—	93	—	—	93
Czechoslovakia . .	1,750	1,781	1,759	98.3	99.5	2.4	—	—	—	—	—	2.7	—	—
Yugoslavia . . w)	609	629	572	96.8	106.4	—	—	—	—	—	—	—	—	—
U. S. S. R. . . . .	872	869	(4) 1,105	100.4	85.9	—	—	—	—	—	—	—	—	—
Total Europe {m}	8,647	8,690	8,399	99.6	102.9	—	—	—	—	—	—	—	—	—
{n}	9,519	9,559	9,414	99.6	101.1	—	—	—	—	—	—	—	—	—
*Japan . . . . .	...	2,105	2,265	...	...	—	f)	—	—	f)	—	—	f) g)	—
Syria and Lebanon	810	941	748	86.0	108.6	—	—	—	—	—	—	—	—	—
Algeria . . . . .	3,153	3,178	3,505	99.2	90.0	—	—	85	120	—	—	—	100	—
Cyrenaica . . . . .	47	82	99	57.7	47.5	—	—	—	—	—	—	—	—	—
*Egypt . . . . .	...	306	364	...	...	105	—	—	103	—	—	103	—	—
French Morocco . .	2,770	3,222	2,995	86.0	92.5	—	—	—	—	—	—	—	—	—
Tunis . . . . .	1,483	1,223	1,285	121.2	120.1	120	—	—	120	—	—	—	—	75
Total Africa . . .	7,453	7,705	7,834	96.7	95.1	—	—	—	—	—	—	—	—	—
Grand Total . {m}	16,910	17,336	16,979	97.6	99.6	—	—	—	—	—	—	—	—	—
{n}	17,782	18,205	17,994	97.7	98.8	—	—	—	—	—	—	—	—	—
OATS.														
Austria . . . . .	...	720	759	...	...	2.5	—	—	—	—	—	2.5	—	—
Spain . . . . .	1,826	1,940	1,902	94.1	96.0	—	—	—	—	—	—	—	—	—
France . . . . .	2,205	2,174	2,021	101.4	109.1	—	—	—	—	—	—	—	—	—
Luxemburg . . . .	74	75	72	98.9	102.9	2.4	—	—	—	3.0	—	2.5	—	—
Switzerland . . . .	...	45	50	...	...	—	—	98	—	—	—	—	—	96
Czechoslovakia . .	2,056	2,042	2,081	100.7	98.8	2.6	—	—	—	—	—	2.5	—	—
Syria and Lebanon	27	27	42	99.5	64.8	—	—	—	—	—	—	—	—	—
Algeria . . . . .	477	557	605	85.5	78.9	—	—	85	110	—	—	—	100	—
French Morocco . .	68	60	82	108.0	77.2	—	—	—	—	—	—	—	—	—
Tunis . . . . .	74	72	109	108.4	67.9	120	—	—	120	—	—	120	—	—

\* Countries not included in the totals. — a) above the average. — b) average. — c) below the average. — d) very good. — e) good. — f) average. — g) bad. — w) Winter crop. — s) Spring crop. — m) Not including the U. S. S. R. — n) Including the U. S. S. R. — (†) See explanation according to the various systems, page 303 — (x) Average 1928-29 and 1929-30. — (2) Towards the middle of the month. — (3) The figure for 1931-32 is that of the area expected to be harvested; the areas for preceding years are those actually harvested. — (4) First estimate of production of 1931-32: 208,588,800 centals (342,618,000 bushels) against 208,074,000 (346,789,000 in 1930-31 and 198,240,000 (330,400,000), the average of the five years ending 1929-30; percentages: 100.2 and 105.2. — (5) The area sown as estimated in spring 1931 was 10 % greater than that finally estimated (2,719,000 acres).

oats have sprouted so badly that in some places the crop has had to be turned in and replaced by barley ; crops that have resisted, as well as barley, have been affected by weeds. The present situation gives ground therefore for anxiety, but, if warm sunny weather is established the prospects will be good, at least for wheat.

*Great Britain and Northern Ireland* : Growth of autumn-sown crops was retarded by the cold, harsh weather during April, but their condition was generally satisfactory. Some resowing was necessary. The cold weather made germination of spring-sown corn slow but the plant was reported to be satisfactory on the whole. Warm weather was needed to stimulate growth.

*Greece* : The April rains were very favourable to the cereal crops.

*Hungary* : Between 21 April and 12 May temperatures were variable and showers and hailstorms were prevalent, though precipitation was below the average. In the third decade of April nocturnal frosts were reported in various parts of the country. Temperature fell to  $-1^{\circ}$  and  $-2^{\circ}$  C also on the night of 11-12 May.

Development of wheat, rye and winter barley was greatly hindered by the long winter and the rather cold dry weather of April. According to crop correspondents condition of winter wheat was average while that of winter rye was a little above average. Wheat, rye, spring barley and oats sprouted fairly well and development is satisfactory. Owing to the late spring both wheat and spring rye sowings have been small compared with those of last year.

*Italy* : In northern Italy the growth of wheat, which was considerably in delay at mid-April, improved notably in a number of provinces during the latter half of the month. In central Italy growth, although backward, is satisfactory whereas in the southern and insular regions the situation varies from good to excellent.

*Latvia* : The average temperature in April was nearly normal and exceeded it only in the western parts of the country. The largest fluctuations occurred from the 10th to the 20th of the month. Precipitation was generally below the normal in the provinces : Livonia, Zemgale and Latgale whereas it was above the normal in the province of Courland. Nearly all of the precipitation was recorded in the first half of the month and in the same period the snow melted.

According to the correspondents' reports, the crop condition of winter wheat on May 1 was average in 33.0 % of the cases, above the average in 62.1 % and below it in 4.9 % ; corresponding figures for winter rye are : 27.2 %, 69.4 % and 3.4 %.

*Lithuania* : Cold weather in April was unfavourable to growth. By the end of the month spring sowings had begun under good conditions.

*Luxemburg* : The generally low temperatures throughout April have caused fairly considerable delay to the normal growth of cereals.

*Netherlands* : Thanks to dry weather during the autumn winter cereal sowings have been effected under favourable conditions. Owing to the mild winter the crops have suffered little damage and few fields have needed re-sowing. During March temperatures were a little below the average but in the first ten days of April rose only to fall again from the 10th. to the 20th. Precipitation in March was considerably below the average but in April considerably above it.

Due to the prolonged drought field work was effected under favourable conditions but the growth of crops was retarded. On April 22, however, crop condition was good to very good.

*Poland* : Damage to crops by unfavourable weather conditions in the past winter was not very large, being 2.8 % for wheat, 3.4 % for rye and 1.3 % for barley. More considerable damage was noted in the departments of the South and East. Last year the damage was nearly twice as large.

Although temperatures in general during April were maintained at the multi-annual average for the month, the majority of correspondents state that towards the middle of April there was insufficient warmth and report backwardness in the growth of winter cereals. April temperatures and sufficient moisture in the fields due to the slow melting of the snow have, however, had a beneficial effect on crop conditions.

Compared with the estimates of the preceding month the condition of all crops has improved, especially as regards wheat and rye. The crop situation is best in the southeastern part of the country, particularly in the departments of Tarnopol, Stanislawow and Volhynia and worst in the departments of Polesie, Cracow and Kielce.

Nocturnal and morning frosts have not, in general, caused much damage to winter crops. Relatively more considerable damage has been noted in the departments of Cracow, Silesia, Kielce, Lodz and Warsaw.

Towards the middle of April spring cereal sowings were effected under not very favourable conditions ; correspondents report delay to the sowings due to the late spring.

*Rumania* : On 5 May the position of field work and sowings was as follows. Throughout the country operations were effected under favourable conditions. Soil conditions and weather were generally favourable for ploughing and spring sowings. Only on flooded land was ploughing impracticable.

Spring sowings were generally four to five days behind due to the prolongation of the winter and to floods.

Autumn cereals have generally wintered well but their growth is backward. The severity of the winter has caused more serious damage in six departments of which the wheat area is generally about 8 % of the total area under wheat, namely, Tutova and Covurlui (in the plain of the Siret and the Prut), Braila and Salomița (plain of the Danube), Caliacra and Durostor (Dobrodja). In some parts of these departments the losses to wheat and autumn barley sowings were between 10 % and 20 %.

The floods of this spring have caused rather serious damage to sowings. Of the departments chiefly affected two are in Bessarabia, two in the Old Kingdom and eight in Transylvania. From 60,000 to 75,000 acres are so damaged.

*Switzerland* : Although the growth of winter cereals was slow and irregular during April, their aspect generally improved compared with the preceding month. The sowings effected early have reached a good stage of growth and have made notable progress. Later sowings, on the contrary, both of rye and of winter barley are in many cases rather thin and weak. For wheat also in many districts there are some fields which have been seriously damaged during the winter.

Spring work was begun in great delay due to the persistence of bad weather ; the sowings have been effected rapidly and under good conditions. Germination has been regular and the spring sowings are generally satisfactory.

Crop condition of spelt and meslin on May 1, was 94 against 92 on April 1, 1932 and 96 on May 1, 1931.

*Yugoslavia* : In April the weather was very changeable. Frequent precipitation and the melting of the snow caused floods, damaging winter cereals. The cold and rain, intensified towards the end of the month, delayed the spring cereal sowings which had only just begun in the first few days of May.

*U. S. S. R.* : This year's sowings began earlier than those of last year but the frequent rains in the latter part of April and beginning of May, especially in the Northern Caucasus and in Ukraina caused delay so that on the whole this spring was less favourable than last.

According to the People's Commissariat for Agriculture the total area sown to spring crops on 10 May was 78,400,000 acres, 31.0 % of that planned and 88.7 % of that sown at the same date last year. The *sovkhosi* have carried out 35.6 % of the sowings planned, the *kolkhozi* 36.1 % and the individualistic holdings 13.1 %.

As regards particular spring cereals the area sown on 10 May was as follows in comparison with that on the same date last year.

<i>Area sown</i> (000 acres).				
	1932	1931	% of plan	
			1932	1931
Wheat . . . . .	32,537	31,954	50.3	46.1
Barley . . . . .	9,620	10,043	54.9	58.0
Oats . . . . .	9,613	14,295	21.3	32.1

With respect to last year the areas sown represent 101.8 % for wheat, 95.8 % for barley and 67.2 % for oats.

In two decrees of 6 and 7 May the Government has provided for an alleviation of fiscal burdens in favour of agriculturists and to stimulate them, has decreased the quantity of cereals to be delivered by the *kolkhozi* and individualistic holdings from the 1932 crop to 39,832 million pounds against 49,366 million pounds in 1931. The remainder, except the part necessary for seed, may be freely sold. The quantity to be furnished to the Government by the *sovkhosi* has, on the other hand, been increased from 3,900 million pounds in 1931 to 5,453 million pounds in 1932.

*Argentina* : In April preparation of the soil and sowings of wheats with a rather long vegetative cycle continued in various areas in generally favourable conditions. The fall of volcanic ash arrested sowings for a few days but no serious damage had been reported.

*Canada* : As in 1931 the Dominion Bureau of Statistics has carried out a preliminary investigation into the extent of wheat-feeding on farms; according to this investigation, the proportion of the 1931 wheat crop retained on farms as feed for livestock and poultry during the crop year ending July 31, 1932 is 11.1 % or 20,226,000 centals (33,710,000 bushels) compared with 9.7 % or 24,414,000 centals (40,690,000 bushels) in 1930-31. The final estimate of last year was slightly over 5 % below the preliminary estimate. For the Prairie Provinces the proportions to be retained for feed compared with those of last year (in brackets) are as follows: Alberta: 10.0 % (9.8 %); Saskatchewan: 6.3 % (5.7 %); Manitoba: 12.0 % (10.5 %).

According to a telegram of May 12 received from the Canadian Government, throughout Canada the spring sowing season has been generally late but promising; the weather has been warm and clear during the past week and seeding has been rushed on. The Ontario winter wheat crop and the Prairie spring wheat crop are particularly promising. About 55 % of the Prairie wheat has now been seeded under the best germinating conditions since 1928. Recently precipitation in the West has been well distributed.

According to an inquiry made by the Canadian Government on farmers' intentions to plant this spring, the following acreages are indicated for spring cereals:

Spring crops	Intended area	Sown	Sown Av. 1926/30	% 1932 1931 = 100	Av. = 100
(000 acres)					
Wheat . . . . .	24,671	25,554	23,092	96.5	106.8
Rye . . . . .	164	179	251	91.6	65.4
Barley . . . . .	3,688	3,768	4,704	97.9	78.4
Oats . . . . .	12,905	12,871	12,971	100.3	99.5
Mixed grains . . . . .	1,198	1,187	1,077	100.9	111.2

*United States* : According to telegraphic information received from the Department of Agriculture at Washington, the weather in the week ended on April 29 was generally favourable for crop growth and spring work. In Western Kansas winter wheat was in very poor condition.

On April 30 the Department of Agriculture issued its monthly progress report on the farm situation stating that from Western Texas to South Dakota, the grain has had to contend with dry weather, dust storms and freezing until the reports indicated a heavy abandonment of acreage in parts of that region. Current reports pointed to a crop of hard red winter wheat about half that of last year. The Plains region as a whole was apparently facing difficult crop conditions with adequate moisture lacking and in the North a serious grasshopper infestation.

In the week ended on May 6 the crop made seasonal progress ; in the Ohio valley winter wheat was in fair condition in western parts. In Kansas rains were very helpful and wheat was in fair to very good condition in the eastern two-thirds but very poor to only poor in the western third. Much of the crop was jointing in parts of these areas. In the Southwest wheat was greatly improved in Texas but condition in Oklahoma ranged from poor to very good. Most winter grains were doing well in the Northwest, with material improvement noted in some parts ; satisfactory progress was reported from the Southeast where heading continued.

During the same week in the spring wheat region seeding was largely completed in the southern portion with much up to good stands and growing nicely. Moisture was rather generally ample for current needs. Spring oat seeding had been practically finished in many northern sections.

Condition of winter oats varied greatly in many parts of the country.

In the following week ended on May 12 rainfall brought about a nearly general improvement in the crop condition of winter wheat ; the crop showed some signs of ripening in the southern section. On May 19 the winter wheat crop in Western Kansas was still in poor condition. Spring wheat sowing had been practically completed by the same date and growth of the crop was good.

*Cyprus* : Although the rainfall towards the end of March was very limited, it was sufficient to improve the prospects for wheat in many areas but more rain was badly required. Barley is very short on the whole and many fields have been grazed off.

*India* : On April 21 the general condition of the wheat crop, on the whole, was reported to be fairly good. Light rain fell in most districts of the Punjab during the week ended on May 2 and was injurious to crops on the threshing floor ; the condition of standing crops was generally average to good but late sown wheat was reported to have been affected by rust in Sialkot and Sheikhpura. In the last week of April light rain fell in parts of many districts in the United Provinces ; crops were further damaged

by drought in Dehra Dun and by hailstorms in Garwhal, Muttra and Aligarh ; standing crops were doing fairly well and prospects were favourable.

The May estimates of the area and production of wheat in the Punjab are slightly lower than those published last April. Area : 10,321,000 acres against 10,572,000 last year and 10,779,000, the average for 1926-1930 ; percentages : 97.6 and 95.8. Production : 70,650,000 centals (117,749,000 bushels) against 78,938,000 (131,563,000) last year and the average of 75,183,000 (125,306,000) ; percentages : 89.5 and 94.0.

*Japan* : Consumption of dung has increased but, owing to the economic depression, that of artificials has decreased.

(Telegram of May 19) : On May 1 crop condition of wheat and barley was fairly good.

*Palestine* : The agricultural situation in the northern areas is somewhat better than was reported last month. The improvement may be attributed to favourable weather conditions prevailing during the greater part of the month of April, and more especially to the heavy rains which fell on April 27th. This rain will be of considerable benefit to the late sown wheat crops. In Southern Palestine the condition of the winter cereal crops generally remains unchanged. Large areas of wheat have died off in the flag. The hot winds experienced for a few days during the month have blighted much wheat in the flowering stage. Considering Palestine as a whole, the wheat crop is in ear, and in the flowering stage in the greater part of the country, but ripening off on parts of the coastal plains. Harvesting of barley was general at the end of April. Crop condition of cereal crops at the beginning of May was poor.

*Algeria* : April was unfavourable ; severe night frosts occurred damaging crops at earing ; drought accompanied by scirocco and high temperatures, persisted from the beginning of March, growth being arrested and earing retarded. Crop condition which was satisfactory at the end of March, was thus, as is indicated in the tables, rather compromised towards 20 April in the Colony as a whole but especially in Oran. In the last week of the month fairly abundant precipitation was general and vegetation was renewed, but moisture remained generally insufficient and fine weather, accompanied by a marked rise in temperature and the return of the scirocco as from the beginning of May made further rains desirable.

Toward the end of the first week of May condition of sowings was still satisfactory in the north of Algiers and Constantine but on the eastern high plateaux development left much to be desired. In the eastern plains of Oran the crop appears to have been much compromised ; only a few areas of wheat in the coastal belt, where earing had not occurred at the time of the frosts, have re-established their position but even they promise only a poor yield ; barley has been more affected than wheat while oats sown on stubble are considered as lost.

In a general way present prospects are of a crop very probably distinctly smaller than the average ; even exceptionally favourable conditions are unlikely to bring it to the level of good years and if moisture conditions leave ever so little to be desired or the scirocco is felt only in the slightest degree the level will be that of last year, that is, about 15 million centals (26 million bushels) of wheat and 13 (27) million of barley.

*Cyrenaica* : Drought has been of exceptional gravity and only very weak rains have fallen in winter and spring. Throughout the south crops have suffered greatly. On the high plateau the crop is problematical.

*Egypt* : The weather has been very changeable though tending to be cold ; but it is considered to have been favourable to the formation of the grain and to the maturity

of wheat, also to the maturity and harvesting of barley. The wheat crop has greatly improved as a result of favourable weather during the formation and development of the grain. Early sown areas are nearly ripe and harvesting was commenced in basin lands at about the middle of April. Yields per acre are expected to be above the average, especially in Upper Egypt. The increase in yield for the whole country is estimated at about 7 %. Harvesting of barley is over in Upper Egypt and at the beginning of May was still in progress in the rest of the country. The condition of the crop is satisfactory and unitary yields are expected to be 5 % above the average.

*French Morocco* : Abundant precipitation since the middle of March has largely made up for the deficiency of rainfall and partly retrieved the situation. In South Morocco even, the sowings, which seemed to be completely prejudiced by the prolonged dry weather, have recovered with some vigour and may, given favourable conditions, result in a passable crop. In the North, the crop situation has become satisfactory on the whole although, towards the end of April, it still left something to be desired on heavy or insufficiently worked land. The alternation, in April, of sunny days and damp nights with morning mists was fairly favourable to the crops, the growth of which progressed rapidly ; this weather, however, also encouraged disease although no serious outbreak has yet been reported.

The situation of sowings was, therefore, at the end of April, much better than at the end of the preceding month and on the whole seemed fairly satisfactory. It does not, however, seem possible that there may eventually be an abundant crop ; at the most, given a persistence of favourable conditions, there may be reached an average of 14.3 to 15.4 million centals (23.9 to 25.7 million bushels) for wheat and 18 to 20 million centals (37 to 41 million bushels) for barley ; it is apparently already certain that it will be considerably smaller than the very good crop of last year ; besides the relatively unfavourable course of the season, account must be taken of a certain reduction in sowings, particularly in the case of barley.

*Tunis* : April weather conditions were favourable to cereals.

Several flights of locusts invaded the southern territory of Tunis at the beginning of April and caused some damage to cereals in the South and some central districts.

## MAIZE

*France* : Bad weather from the beginning of April hindered field work and caused a rather serious delay to sowings. Sprouting was hindered by excessive humidity and lack of warmth.

*Hungary* : At the beginning of the second week of May planting of maize was continued ; the early planted crop is sprouting.

*Italy* : Sowings were carried out normally in April.

*U. S. S. R.* : According to the Government plan, the area to be planted to maize in the spring of the present year is 11,100,000 acres against 9,801,000 planted in 1931.

*United States* : In the week ended on May 6 maize planting, except in the lower Missouri Valley and in the Southwest, was delayed by cool weather. In the Southwest the early crop was mostly up to good stands but growth was retarded. On May 19, planting was progressing well.

*Palestine* : Early sown irrigated and unirrigated maize crops show a good germination and forward growth. Crop condition as at 1st May was poor.

## Maize.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931 — 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 — 1931/32	1931	1930
	1931/32	1930/31	1925/26 to 1929/30	1930 — 1931 = 100	Aver. 1930/1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 — 1931 = 100	Aver- age 1930/1931 = 100
	1,000 acres					1,000 centals			1,000 bushels of 56 lbs				
Austria . . .	148	143	146	108.9	101.7	3,814	2,668	2,490	5,917	4,766	4,447	124.4	138.1
Bulgaria . . .	1,676	1,689	1,671	99.2	100.3	21,983	17,088	14,713	39,256	30,515	26,274	128.6	149.4
Spain . . . .	1,053	1,106	1,057	95.2	99.6	14,778	16,152	13,144	26,889	28,844	23,471	91.5	112.4
France . . . .	833	833	848	99.9	98.2	13,246	12,532	9,428	23,654	22,370	16,837	105.7	140.5
Greece . . . .	523	546	503	96.7	105.0	3,008	3,809	3,597	5,371	6,802	6,423	79.0	83.6
Hungary . . .	2,720	2,605	2,662	104.4	102.2	33,459	31,021	39,546	59,749	55,394	70,618	107.9	84.6
Italy . . . .	3,426	3,490	3,541	98.1	96.7	41,519	62,832	51,754	74,142	112,200	92,418	86.1	80.2
Poland . . . .	238	255	218	98.4	109.3	2,266	3,003	2,013	4,046	5,362	3,595	75.5	112.6
*Portugal . . .	243	233	217	104.2	111.6	2,296	1,847	1,940	4,099	3,299	3,464	124.3	118.3
Rumania . . .	865	868	827	99.6	104.6	9,364	7,950	7,950	16,722	14,196	14,196	...	...
Rumania . . .	11,749	10,939	10,606	107.4	110.8	138,418	99,648	99,979	247,175	177,942	178,534	138.9	138.4
Switzerland . .	8	2	3	79.2	76.4	64	84	114	114	114	150	100.0	75.9
Czechoslov. . .	344	360	343	95.6	100.5	5,020	5,479	5,363	8,965	9,783	9,577	91.6	93.6
Yugoslavia . .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	126,688	136,395	120,279	92.9	105.3
Total Europe .	29,119	28,299	27,390	102.9	106.3	350,316	332,619	311,407	625,565	693,785	556,087	105.4	112.5
*U. S. S. R. . .	9,801	9,684	8,386	101.2	116.9	...	...	79,114	...	...	141,275	...	...
Canada . . . .	181	161	174	81.2	75.2	3,039	3,268	3,703	5,426	5,826	6,618	93.1	82.1
United States .	104,970	100,743	99,560	104.2	105.4	1,431,843	1,153,704	1,587,197	2,556,863	2,060,185	2,745,001	124.1	93.1
Mexico . . . .	7,939	7,599	7,709	104.5	103.0	42,589	30,353	44,001	76,962	54,201	78,574	140.1	96.7
Tot. N. Amer. .	113,040	108,603	107,443	104.2	105.2	1,477,421	1,187,320	1,584,901	2,638,251	2,130,212	2,830,138	124.4	93.2
China: Manchuria . .	2,441	2,139	2,469	114.1	98.9	37,754	35,030	37,848	67,418	62,554	67,536	107.8	99.3
Syria and Leb. .	67	61	121	109.7	55.2	770	600	1,370	1,376	1,071	2,449	128.5	56.2
Algeria . . . .	24	24	25	99.2	97.0	133	164	144	238	292	257	81.3	92.7
Eritrea . . . .	22	22	13	100.0	166.7	132	198	79	236	354	142	66.7	166.7
Kenya (1) . . .	196	206	201	94.9	97.6	1,922	3,299	2,475	3,432	5,892	4,420	58.3	77.7
Fr. Morocco . .	864	649	661	133.1	154.1	2,982	3,335	2,973	5,326	5,954	5,309	89.4	100.3
It. Somaliland .	23	40	39	70.6	72.9	301	530	428	537	946	760	56.8	70.7
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	108	197	236	192	83.3	102.5
Total Africa . .	1,178	978	884	120.2	133.6	5,580	7,658	6,205	9,966	13,674	11,780	73.9	89.9
Argentina . . .	14,468	13,776	11,649	105.0	125.3	150,246	231,707	165,215	268,296	413,763	295,028	64.8	90.9
*Chil. . . . .	89	92	88	96.7	101.0	...	1,516	1,229	...	2,707	2,194	...	...
Madagascar . .	227	229	207	99.2	110.0	2,023	1,623	2,302	3,622	2,898	4,111	125.0	88.1
Un. of S. Afr. .	5,732	5,370	5,148	106.7	111.3	34,130	32,016	35,776	60,946	57,171	63,885	106.6	95.4
Grand Total . .	166,272	159,355	155,211	104.3	107.1	2,053,245	1,828,473	2,145,024	3,675,440	3,265,128	3,830,411	112.6	96.0

\* Countries not included in the totals. — s) Late crop («maggengo»). — t) Early crop («cinquantino»). — (1) European crop. — (2) Maize and sorghum.

*Algeria*: The sprouting of maize, like that of all the spring sowings, has been greatly retarded by persistent dry weather from the beginning of March to the end of April. Rain in the last week of April was very beneficial but it will be difficult for arrears of growth to be made up and fears are entertained of the effects of the first hot days. Prospects consequently are not very good.

*French Morocco*: Abundant precipitation since the middle of March throughout the whole territory has largely made up the previous deficiency of rainfall with the result that soil moisture is normal and the sowings could be carried out under very good conditions and, it seems, on a particularly increased area this year. The alternation, in April, of sunny days and damp nights with morning mists favoured the sowings and their appearance is very satisfactory.



*Tunis* : Weather conditions in April were favourable to the crops.

*Union of South Africa* : Beneficial rains fell fairly generally at regular intervals throughout the Union in March and the crop in the principal producing districts made good progress as a result of the excellent precipitation during February and March. Except where maize suffered during the preceding drought good yields will be obtained. The late crop may, however, be caught by early frosts, especially in the highveld. In certain areas, especially in Natal, progress has been remarkable.

## RICE

### The world rice situation (1).

From the data of production now available, covering countries that accounted in 1930-31 for about 93 % of the world total, excluding China, for which no reliable statistics exist, there is no doubt that world rice production in 1931-32 has been considerably smaller than in the previous season. Production in 1930-31 was, however, at 130,000 million pounds, about 7 % above the average of the five years ending 1929-30.

While production in British India (excluding Burma), by far the world's greatest producer, with the possible exception of China, has increased in 1931-32, that of most of the other important producers, Japan, Java, Burma, Siam and Korea, has fallen sufficiently to outweigh this considerably. In French Indo-China production has apparently as a whole changed little.

Even without taking into account the statistically unknown production of China, all but 6 % of the world's total on the average of the five years ending 1930-31 was produced by the countries of monsoon Asia.

By far the greatest proportion of the rice entering into international trade also originates in monsoon Asia, the principal surplus countries being Burma, French Indo-China (chiefly Cochin-China), Siam (almost entirely the seven inner circles), Korea and Formosa. Since the two last-named countries supply principally Japan and form with that country practically an economic unit the supply situation on the world market depends principally on the crops of Burma, French Indo-China and Siam.

### *Production and net export of major exporting countries* (million pounds milled rice).

Production				Net export				
YEAR	Burma	Indo-China	Siam (seven inner cir- cles)	YEAR	Burma (1)		Indo-China	Siam (2)
					to foreign countries	to Indian ports		
1931-32 . . . . .	9,868	...	3,840	1932 . . . . .	...	...	...	...
1930-31 . . . . .	11,520	8,557	4,351	1931 . . . . .	4,323	3,177	...	...
1929-30 . . . . .	11,169	8,655	3,897	1930 . . . . .	5,187	2,015	2,287	2,026
1928-29 . . . . .	10,844	8,498	3,494	1929 . . . . .	3,930	2,269	2,883	2,192
1927-28 . . . . .	10,945	9,462	4,406	1928 . . . . .	3,379	2,856	3,501	2,864
1926-27 . . . . .	11,451	8,827	5,112	1927 . . . . .	4,383	2,414	3,309	3,305
1925-26 . . . . .	10,624	8,501	3,713	1926 . . . . .	4,621	1,457	3,219	2,498
1924-25 . . . . .	11,350	8,341	4,780	1925 . . . . .	4,805	2,754	2,943	2,597

(1) The official data are for rice both in the husk and not in the husk, but, as practically all the rice exported is milled, they have been taken to represent milled rice.

(2) Exports from Bangkok, which in the five years ending 1928-29 made up 98 % of the value of the total rice exports from Siam. Data refer to the season 1 April-31 March.

(1) Unless otherwise stated the data are in terms of milled rice and those of production refer to the year from 1 April to 31 March. Rice bran and rice polish are not included in the trade figures.

## THE SITUATION IN THE THREE GREAT SURPLUS-PRODUCING COUNTRIES.

The rice crop in Burma fluctuates only slightly about 11,000 million pounds owing to the comparative stability of the area devoted to the crop and to the comparative reliability of the monsoon rains in that area. In 1931-32 there was, however, a larger change than usual in the area, which, owing to the low prices, declined by 3.9 % to 12,511,000 acres, and this, with the weakness of the late rains, resulted in a production of 9,368 million pounds, as finally reported, that is, a decrease of 18.7 % on the production of 1930-31. The final estimate of the export surplus showed a reduction to 5,450 million pounds, 23 % less than the previous season's surplus. Thus, with the apparent absence of any carryover from the previous crop, the supply situation in 1932 appears very much more favourable than in 1931. Arrivals of "five-parts cargo rice" by rail and boat at Rangoon from 1 January 1932, which may be fairly taken as the commencement of the export season, to 23 April 1932 were 2,061 million pounds against 2,003 million in the corresponding period of 1931, while exports from Rangoon to foreign ports and to Indian ports were respectively 1,528 million and 306 million pounds (against 1,308 million and 694 million in 1931) in all 1,834 million against 2,002 million pounds. These exports normally make up about three-quarters of the total export of Burma. Burma has had an advantage over Siam until the recent suspension of the gold standard by that country, and to a less extent over French Indo-China in the depreciation of sterling, to which its currency is linked.

*Production in Indo-China*

(million pounds milled rice).

Year	Cochin-China	Cambodia	Tonkin	Annam	Laos
1931-32 . . . . .	3,210	...	2,639	1,289	480
1930-31 . . . . .	2,698	1,164	2,911	1,304	480
1929-30 . . . . .	3,165	947	2,708	1,360	480
1928-29 . . . . .	3,165	882	2,634	1,322	495
1927-28 . . . . .	3,517	1,151	2,724	1,508	587
1926-27 . . . . .	3,280	1,309	1,990	1,734	524
1925-26 . . . . .	2,896	1,066	2,643	1,388	509
1924-25 . . . . .	3,239	815	2,225	1,601	461

The export from French Indo-China originates mainly in the delta of the Mekong in Cochin-China, a country which produces about one-third of the total and which, like Burma, has always a large surplus for export. Yields in Cochin-China fluctuate proportionately much more than those in Burma, however, and in 1931-32, despite a decrease of 9.7 % in area, production increased by 19 %. There were great variations in the rainfall as between different areas.

In Cambodia, of which the rice area belongs geographically to the same region as that of Cochin-China, the crop situation has been reported to be satisfactory but statistical data are not yet available.

Tonkin, though second to Cochin-China in the size of its crop, has, owing to the pressure on the means of subsistence of the dense population in the delta of the Red River, normally little or no surplus. The crop of the tenth month, that is, the summer crop mainly harvested in November and the most important in the country, was 8.2 % below the record of 1930-31, while the total production of Tonkin is estimated to be 9.4 % below that of 1930-31.

In Annam, as in Tonkin, the crop of the tenth month is the more important. Despite a decrease of 22.8 % in area and drought at transplanting in the north, which is the chief producing area, the production of this crop is estimated to be 17.9 % greater than in 1930-31. The crop of the first semester, of which the area was also 22.8 % less, is estimated to be 30.1 % smaller than in 1930-31.

In Laos production has probably been about the same as last year as, though area had increased somewhat, there was drought at the time of transplanting. Arrivals at Cholon and exports from Saigon in the early part of the year were larger than in the corresponding period of 1931.

In the seven inner circles of Siam, which produce three-fifths of the total crop and generally practically all of the export, the low prices caused, as in Burma, a decline in the area sown and production was further decreased by the high percentage of damage. The production of these circles was finally estimated at 3,840 million pounds, a decrease of 11.7 %. The exportable surplus from the new crop is 1,960 million pounds against 2,940 million last year. It is expected that, thanks to greater household economy, there will be a considerable quantity of rice available this year from the northern and north-eastern circles, which normally have little or no surplus. The carryover from 1930-31 was 504 million pounds against 336 million at the beginning of the previous season.

The difficulties of the trade situation induced the Siamese Government in the early part of May to suspend the gold standard; the tical is now reduced to its old rate of 11 to the pound sterling. The fact that the currency reserves are in sterling effectively links the tical to the pound. Siam's competitive power is thus greatly enhanced and the severity of its competition with Burma is likely to be accentuated.

#### THE SITUATION IN THE MINOR EXPORTING COUNTRIES.

Amongst minor exporting countries the United States, Italy and Spain are important as producers of high-quality rices. Production in the United States has increased slightly with increased area and production in California, which outweighed a decrease in production in the three southern states (Arkansas, Louisiana and Texas). There was a decrease in 1931 in United States exports of whole rice, which go principally to the United Kingdom and Germany. The leading European producers, Italy and Spain, have both had smaller crops, the former 2.9 % and the latter 14.8 % less than in 1930-31, the reduction in Spain being proportionately considerably greater than the decrease in area. Both countries experienced in 1931 a considerable decrease in their exports, which in the case of Italy go principally to Argentina and in that of Spain to the United Kingdom.

#### *Production and net export of minor exporting countries* (million pounds milled rice).

YEAR	Production			YEAR	Net export		
	Italy	Spain	U. S. A.		Italy	Spain	U. S. A. (1)
1931 . . .	948	411	1,863	1932 . . .	...	...	...
1930 . . .	975	482	1,842	1931 . . .	300	88	178
1929 . . .	1,010	462	1,230	1930 . . .	432	125	186
1928 . . .	947	448	1,316	1929 . . .	357	86	224
1927 . . .	1,043	478	1,355	1928 . . .	393	131	253
1926 . . .	1,019	494	1,159	1927 . . .	550	118	187
1925 . . .	962	472	925	1926 . . .	389	142	85
1924 . . .	886	456	902	1925 . . .	341	90	28

(1) In the figures for net export of the United States broken rice is not included.

Egypt, though its production fluctuates greatly with the variations in area available for rice cultivation and in unit yields, both due to the variations in the amount of water in the perennial canals available for the *sefi* (summer) crop, has in recent years maintained an export surplus. Though water was on the whole adequate last summer, unit yields of the *sefi* crop were slightly below average. Yields of *nili* (winter) rice were normal. The market for Egyptian rice is mainly in Syria, Palestine, Rumania and Greece. Imports consist almost entirely of cheaper rice from Burma.

In South America Brazil is the principal country with an export surplus. There has been a great increase in production in post-war years, though the amount available for export fluctuates considerably. Argentina, Uruguay and Germany are the chief markets for Brazilian rice. British Guiana, where rice cultivation is being encouraged by the Government has, on a smaller scale, an increasing surplus which finds a market principally in the Caribbean.

#### CONDITIONS IN THE PRINCIPAL RICE-IMPORTING COUNTRIES.

By far the greatest countries of deficit are Japan, India and China, followed on a much lower scale by the Netherlands East Indies, British Malaya, Ceylon and the Philippines. As production in Korea and Formosa has greatly increased in recent years and Japan takes by far the greater part of its imported supplies from these dependencies, which market almost their entire surplus in the mother country, the most important markets for the great exporters are India and China.

For British India, where one-third of the population is estimated to consume rice, the principal source of outside supplies is Burma. In 1931 Indian imports of Burma rice rose to 3,177 million pounds the highest level of recent years. This year the coast-wise exports of Burma to Indian ports had not up to 23 April attained the level of the corresponding date in 1931. According to the final estimate, the production of India, excluding Burma, for 1931-32 has been 64,037 million pounds an increase of 5.7 % on that of 1930-31. There were increases in all provinces and States save Madras and Mysore. These, like the United Provinces, Assam and Bombay, had a decrease in area, while India as a whole, excluding Burma, increased the area under rice by 2.6 % to 71,523,000 acres.

#### *Production in certain provinces of British India* (million pounds milled rice).

YEAR	Bengal	Bihar and Orissa	Madras	All India (1)
1931-32 . . . . .	21,276	12,855	11,782	73,405
1930-31 . . . . .	20,621	12,576	12,042	72,124
1929-30 . . . . .	18,372	13,465	11,771	69,736
1928-29 . . . . .	21,692	12,517	11,641	71,989
1927-28 . . . . .	14,544	9,807	11,386	63,244
1926-27 . . . . .	16,475	10,725	10,622	66,483
1925-26 . . . . .	18,408	10,951	11,921	68,551
1924-25 . . . . .	17,273	13,492	10,994	69,801

(1) The all-India statistics exclude the production of the Punjab, the North-West Frontier Province, Ajmer-Merwara, Manipur Pargana, and certain other Indian States, which together produced 2,388 million pounds on the average of the five years ending 1929-30; they also exclude the production of the feudatory states of Bihar and Orissa, for which no reliable data are available.

The chief producers in India proper are Bengal, Bihar and Orissa and Madras. The first two have each a larger production than Burma. In Bengal the very favourable weather during reaping and threshing of the winter crop outweighed the effects of the floods in July and an increase in production of 3.0 % is estimated; autumn, winter

and summer rice are together estimated at 3.2% above the total for the previous year. In Bihar and Orissa the winter crop was satisfactory and the total of autumn, winter and summer crops is now estimated at 2.2 % above that for 1930-31. In Madras there was a decrease of 0.6 % in area and with unfavourable weather, production declined by 2.2 %.

Given the increase of 5.7 % in the production of the area as a whole, the preference for home-grown qualities and the continuance of depression in the main export staples the demand for Burma rice in India is not likely to approach the high level of 1931.

The most outstanding feature of the rice situation in China is the effect of the great floods in the Yangtse and Hwai valleys, which affected areas producing probably at least half the total crop and not only destroyed the standing crop and prevented second crops being planted but must result in a serious diminution of this year's spring crop owing to the shortage of seed and the waterlogging of the soil. A population of no less than 50 millions has been affected, the food supply of a large proportion of whom was during the past winter reduced below the usual "subsistence" level, famine having prevailed in some areas.

The supply of the destitute population with imported food depends on the funds of the relief organisations and the extent to which these organizations can operate unhampered by the chaotic conditions created by war and brigandage.

The fall in prices has enabled foreign supplies to be drawn upon despite the fall in the value of silver and, though ample stocks were known to exist in Shanghai at the beginning of the year and demand in that area was somewhat disorganized by military operations, there was a considerable revival in imports of Burma rice in February.

While the total production in China both in 1931-32 and in the new season is undoubtedly greatly reduced by the floods and their after-effects and an unusually great absorptive capacity for imported rice undoubtedly exists it remains doubtful how far political and financial conditions will allow the demand to be realized. The value of silver remains low though it has during the past year recovered from the minimum of 12 d an ounce reached in February 1931 and the silver market is still overshadowed by a considerable surplus; while the effects on China's imports of rice have been largely counteracted by the fall in rice prices, the low level of silver must cause the purchasing-power to be still less than it would otherwise have been.

The remarkable development of imports from Burma in 1930 was not maintained in 1931, when the large figure of the previous year was reduced by more than two-thirds.

*Sources of supply of Japan*  
(million pounds milled rice).

YEAR	Production			YEAR	Net import of Japan		
	Japan	Korea	Formosa (first crop, June-August)		From foreign countries	From Korea	From Formosa
1931-32 . . . . .	17,346	4,999	1,140	1932 . . . . .	...	...	...
1930-31 . . . . .	21,010	6,048	1,094	1931 . . . . .	(x) 142	...	...
1929-30 . . . . .	18,709	4,305	896	1930 . . . . .	272	1,316	...
1928-29 . . . . .	18,945	4,245	1,004	1929 . . . . .	396	1,437	521
1927-28 . . . . .	19,510	5,435	1,022	1928 . . . . .	614	1,314	567
1926-27 . . . . .	17,465	4,807	890	1927 . . . . .	1,278	1,438	642
1925-26 . . . . .	18,757	4,641	997	1926 . . . . .	748	1,457	578
1924-25 . . . . .	17,961	4,153	868	1925 . . . . .	1,671	983	567

(x) Net export.

The Japanese crop has fallen below the record of 1930-31 by 17.7 % to 17,346,000 pounds, 7.4 % below the average of the five years ending 1929-30. As the area sown

was, as usual, slightly larger than in the previous year, the relatively small production has been due to bad weather, particularly to the cold wet weather at transplanting. The deficit in production is therefore this year larger than in the last four years. All rice imports are under Government control, the high and increasing costs of home production making competition of home-grown rice with rice from outside sources impossible, despite the preference of the population for the home-grown varieties. In Korea, by far the most important source of imports, the 1931-32 crop, though 6.7 % above the average for the five years ending 1929-30, has fallen from the record of 1930-31 by 17.3 %, a proportion almost identical to that in the case of Japan and due, as in the latter country, to unfavourable weather. Formosa, which has normally a surplus from its first crop, is also an important source of supply, though Japan's imports from this dependency tend to decline. The rice from this source, though comparatively cheap, is of a quality that makes it less popular. Both the first and second crops of Formosa have been larger than in 1930-31. By far the greater part of the imports from foreign sources in the last few years have originated in Siam, in the form of broken and glutinous rice, the quantities taken from French Indo-China having become insignificant. The situation this year is thus on the whole favourable to increased foreign imports, available supplies within the Japanese territories being much smaller than last year, even allowing for the exceptionally large carryover in Japan from the previous year, and the low world prices combined with the particularly marked inelasticity of Japanese rice consumption are probably sufficient to counteract the effects of the general depression of purchasing-power.

*Net imports into other principal Asiatic countries of deficit*  
(million pounds milled rice).

YEAR	China	Netherlands East Indies	British Malaya	Ceylon
1931 . . . . .	(1) 1,431	...	1,147	1,003
1930 . . . . .	2,047	1,370	1,315	1,064
1929 . . . . .	1,439	1,596	1,235	1,102
1928 . . . . .	1,883	1,234	1,162	1,093
1927 . . . . .	2,799	1,013	1,228	1,053
1926 . . . . .	2,489	1,320	1,067	1,083
1925 . . . . .	1,679	1,109	907	972

(1) The figure for 1931 should be slightly larger since, while imports for re-export are not included, re-exports are included in the calculation.

The importing countries of the second rank are all countries depending for their prosperity on the export of plantation crops, the slump in the values of which has on the one hand reduced the purchasing-power of the local population and on the other stimulated an increase in the local production of rice growing due to the unprofitability of the export crops.

In British Malaya the depression is particularly acute owing to the very low prices for both rubber and tin, the staples on which the prosperity of the country depends. Cultivation of rice, formerly neglected in favour of rubber, is now being revived with Government encouragement. The 1931-32 crop is reported to be good. Increase in the local supply affects particularly Siam and Burma, from which the imported rices are principally drawn. The former country has in recent years been losing some ground to the latter.

The imports into the Netherlands East Indies are principally into the Outer Provinces, where increase of population has been most rapid and the concentration of the natives on export crops has been most marked and where comparatively few areas have a surplus. Factors similar to those in British Malaya are operating; in 1931-32, however,

production in Java, where the greater part of the crop is produced, has been smaller and this, together with the lower prices, may maintain demand.

In Ceylon the reduction in purchasing-power due to the reduced employment on rubber and tea estates, together with the fact that this is now enabling the attempts to encourage local rice production to meet with success, caused a further reduction in the import of rice in 1931, the decline in the imports of the more expensive qualities from British India out-weighing the increase in imports of Burma rice, and may be expected to have a similar effect this year.

In the Philippines, which import principally from French Indo-China and Siam, rice production has been further stimulated by the new tariff rates, while in Cuba there has been a tendency recently to decreased import of Oriental rices.

#### THE PRINCIPAL EUROPEAN IMPORTING COUNTRIES.

Of the total quantity of rice entering into international trade European imports make up about one-fifth. A very large part of this import is however, destined for re-export, the greater proportion after being worked up in European mills. The principal European importers are Germany, France, the Netherlands and the United Kingdom. Germany takes rough rice and milled rice in relative proportions varying from year to year, France by far the greater proportion milled, the Netherlands principally rough rice and the United Kingdom entirely milled rice. Imports into these four countries, especially into Germany, showed a further increase in 1931. As regards consumption of rice, whether for industrial or alimentary purposes, Germany takes the first place, followed by France and the United Kingdom. The Netherlands, while they import a larger quantity than the United Kingdom, have a proportionately very large reexport of milled rice. France has the largest reexport, followed by Germany. As a whole reexports declined in 1931 being affected in the rice-consuming countries overseas by the same conditions as the direct exports from the rice-growing countries.

Germany's imports of rough rice are mainly from Burma, its imports of milled rice from Burma, the United States, Brazil the Netherlands East Indies and Italy. In 1931 its imports of rough rice increased by 90 % over those of 1930 and in the first quarter of 1932 were over four times those in the first quarter of 1931; the corresponding increases for milled rice were 25 % and 14 %. Reexports of milled rice, which are very widely distributed but destined mainly for Czechoslovakia, Colombia and Portugal, declined by 14 %.

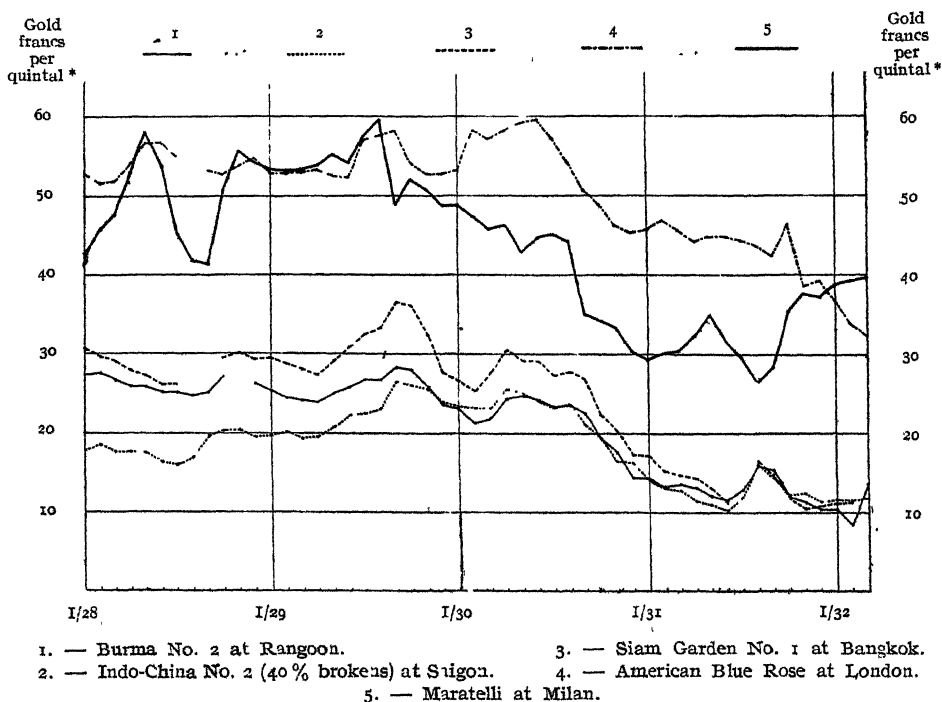
The total rice imports of France increased in 1931 by 43 %. Rough rice is imported mainly from Italy, milled rice from French Indo-China. Re-exports, which are principally to the French colonies, especially to those in West Africa, and consist largely of broken, have declined steadily in recent years and in 1931 showed a further large decline.

There was an increase in 1931 in the imports into the Netherlands, which consist in by far the greater part of rough rice from Burma. In the first quarter of 1932, however, imports of rough rice were only about one-third of those in the corresponding period of 1931. The Dutch rice trade, depending by its nature much more on general world conditions than that of the other three great European importers, reflects the general economic depression more clearly. The reexports, which are almost entirely of milled rice and until now had been increasing steadily, are very widely distributed, though Germany has been a predominant market.

Imports into the United Kingdom in the last three years have been entirely of milled rice, chiefly from Burma, Spain and the United States. A very great part of those from Burma are broken. Imports in 1931 were larger than in 1930 and in the first quar-

ter of 1932 show an increase of 30 % over those of the corresponding period of 1931. Reexports of rice without further elaboration, which are mainly destined for the British West Indies and the Irish Free State, were almost exactly doubled in 1931; those of rice that has undergone further preparation in the United Kingdom and which are almost entirely to West Africa, decreased by 35 %.

*Prices of certain kinds of rice on leading markets during last four years.*



\* One gold franc per quintal equals 2.43 dollar-cents gold per American bushel.

#### THE GENERAL OUTLOOK.

World production in 1931-32 appears to have been smaller than in 1930-31. On the one hand, production in the three great exporting countries has been much smaller, as also that in China, in Japan and its dependencies and in Java; on the other hand, in British India and probably also in several of the importing countries of the second rank it is larger and there were large carryovers from the previous season in certain countries, particularly in Japan. While crop results are on the whole more favourable to international trade in the commodity than they were last year, when bumper crops were obtained in several important countries, there are factors of a more general character, such as the depression affecting the staple sources of income of many importing countries, the persistent low value of silver, and the continuance of political and economic disturbances in China. Though prices have shown some recovery from the low levels to which they fell in the last quarter of 1931, the rise in January 1932 being accelerated in February as the estimates of relatively small crops in several of the leading producing countries



became known and demand from China and Japan increased, any notable recovery is not to be expected in the immediate future. The position is, in fact, that in the present year, the continuance of low rice prices appears to be a condition of maintaining trade in the commodity.

C. J. R.

\* \* \*

*Italy* : Sowings began in the latter part of April.

*U. S. S. R.* : According to the Government plan, the area to be sown to rice in the spring of the present year is 482,000 acres against 337,000 sown in 1931.

*United States* : On May 6 the rice crop was very late in Louisiana but rains had been decidedly beneficial.

*Formosa* : Favoured by the weather the growth of first crop rice was considered to be fairly good on May 1; a satisfactory crop was hoped for. In the southern provinces the early crop had begun to ripen.

*India* : Light to moderate rains in the latter half of April in Bengal improved the conditions for paddy, sowing of which continued in full swing. In the first ten days of May rainfall was heavy in parts of West and East Bengal; elsewhere it was light to moderate, benefiting standing crops generally. Sowings were far advanced in East Bengal but elsewhere more rain was needed, especially in North Bengal. In Bihar and Orissa mostly light rains fell in many districts in the latter half of April. In the latter half of April rainfall was mostly light in parts of the South and West of Madras Presidency.

## POTATOES

*Germany* : At the end of April potato planting was in progress.

*Austria* : At the end of April sowings of early varieties were everywhere in progress, while those of late varieties had just begun here and there.

*Belgium* : An extension of sowings is expected.

*France* : The bad weather since the beginning of April hindered field operations and caused great delay in planting; germination was also affected by excessive humidity and lack of warmth.

*Hungary* : At the beginning of the second week of May potato planting had been largely finished, while the early sown varieties were sprouting.

*Italy* : Lifting of early varieties was carried out normally in April.

*Luxemburg* : The generally low temperature throughout April have caused fairly considerable delay to the normal growth of potatoes.

*Argentina* : In April lifting continued under generally favourable conditions. Yields are greater than at first expected.

*Cyprus* : Towards the end of April the condition of the new crop was satisfactory and production prospects were good.

*Palestine* : The lifting of the potato crop has been completed in the southern areas. Yields have been comparatively good. In Northern Palestine the crop is developing favourably.

*Algeria* : Spring potato crops have been severely tested by dry weather, cold, frost and sirocco winds ; yields are expected to be rather unsatisfactory.

*Tunisia* : Weather in April was favourable.

*Union of South Africa* : Apart from the damage by drought, blight and eelworm have been very generally reported from the highveld areas and this may bring about a reduction in later estimates.

## SUGAR

Beet sowings were completed in May, even in Central and Northern Europe, one to two weeks late. In Southern Europe growth is also backward.

In Germany, in addition to the general delay, sowings were not carried out in good conditions, the almost complete absence of rain from November to March having resulted in drought ; the rain at the beginning of May was very beneficial. In Austria the first sowings suffered some damage from insects. In Belgium the cold hindered sowings and development of the young plants. In France the weather up to the middle of March was generally dull and rainy but sowings were not hindered. In England and Wales also the changeable and often very cold weather was unfavourable but did not cause serious damage. Sowings in the Netherlands were made under satisfactory conditions. In Poland sowings were seriously hindered but at the end of April they were in full progress. In Czechoslovakia the temperature rose again at the end of April but the nights remained cold ; the general conditions were favourable to preparations and sowings, which are now completed ; first growth took place some time ago.

### *Acreege of Sugar Beet.*

COUNTRIES	1932 (*)	" 1931	Average 1926 to 1930	% 1932	
				1932 = 100	Average = 100
				%	%
Acres				%	%
Germany . . . . .	562,348	786,002	1,039,694	71	54
Austria . . . . .	107,500	106,000	69,381	101	155
Belgium . . . . .	150,000	140,178	154,685	106	96
Denmark . . . . .	89,000	74,600	90,659	119	98
Spain . . . . .	185,000	250,000	165,519	75	112
Irish Free State . . . . .	18,100	5,012	14,246	258	91
Finland . . . . .	6,200	4,990	5,281	124	117
France . . . . .	620,000	599,500	629,283	103	98
Great Britain . . . . .	280,000	234,174	223,923	119	125
Hungary . . . . .	91,500	138,475	171,953	66	53
Italy . . . . .	170,000	264,000	252,128	65	69
Latvia . . . . .	17,000	11,100	(1) 5,200	158	333
Netherlands . . . . .	111,000	92,609	152,928	120	73
Poland . . . . .	321,000	367,200	516,594	87	62
Rumania . . . . .	50,000	37,000	157,702	133	31
Sweden . . . . .	96,990	87,170	75,428	113	131
Switzerland . . . . .	3,200	3,200	3,573	100	90
Czechoslovakia . . . . .	403,000	460,871	636,664	87	63
Turkey . . . . .	35,062	20,000	20,750	177	169
Yugoslavia . . . . .	90,740	91,200	119,440	100	76
Total Europe a) . . . . .	3,402,640	3,773,281	4,505,029	90	75
U. S. S. R. . . . .	4,127,000	3,693,800	1,869,132	112	221
Total Europe b) . . . . .	7,529,000	7,467,081	6,374,161	101	118
Canada . . . . .	...	51,000	47,670	...	...
United States . . . . .	...	720,000	710,218	...	...

(\*) Approximate data

(1) Average 1929 and 1930. — a) Not including the U. S. S. R. — b) Including the U. S. S. R.

On the whole, throughout Europe, though growth is backward, condition of the roots is satisfactory.

As regards area sown no important changes have been reported since the publication of the April "Crop Report". For Rumania only an important increase on the first estimate, which has been doubled, is reported, according to the latest information received by the Institute; in the latter half of March the Ministry of Agriculture, taking the existing stocks and the decrease of consumption into account, estimated that according to the first estimate, there would be a considerable reduction on last year; in a second communication it intimates that in the latter half of April, following an agreement between growers and factories, the area to be cultivated this year was fixed at about 50,000 acres.

For Germany the data in the table of areas calculated on the basis of the official data, which comprise the total beet area, have been replaced by those received from the Sugar Manufacturers' Association which refer only to beet for the production of sugar.

In the European beet countries as a whole, however, the modifications are slight and the estimates remain much the same as last month.

E. R.

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*Austria* : At the end of April sowings had not yet been completed. Those made early were severely attacked by nematodes.

*Belgium* : A slight extension of the beet area is expected.

*France* : Bad weather from the beginning of April delayed preparation of the soil for two or three weeks and hindered germination.

*Hungary* : Sugar beet have sprouted fairly well. Damage by insects is reported.

*Italy* : The aspect of sugar beet is good, although growth is a little backward.

*U. S. S. R.* : The sugar beet sowings are being accomplished more slowly than last year. The area sown as on May 10 last was 1,075,000 acres or only 26.0 % of the total area forecast for this year. Last year on 10 May 1,725,000 acres had been sown.

*Formosa* : According to a telegram received at the beginning of May the weather conditions had favoured cane in the plantations being cut; harvesting had been almost finished on May 1. The weather had also favoured new cane planted up to the spring, which was growing well.

*India* : Weather in the Punjab was mostly dry in April until the last week of the month when light rains fell in parts of nearly all districts; the condition of crops on May 2 was generally average to good. April weather was also dry in the United Provinces until light rain fell in the latter half of the month; drought continued in Dehra Dun and hail fell in a few districts; standing crops were generally doing fairly well and prospects were favourable. Mostly scattered light rains fell in Bihar and Orissa in the latter half of April; standing crops were generally in good condition except in Champaran where prospects were not fair.

*Egypt* : Weather has been favourable to germination and growth despite its instability. Irrigation water has been sufficient. In Upper Egypt sowings are approaching completion and in Lower Egypt are completed in some localities. Germination and growth are satisfactory.

*Production of Cane Sugar.*

COUNTRIES	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	Percentages for 1931-32	
							1930-31 = 100	Average = 100
	Thousand centals			Short tons			%	
AMERICA.								
Argentina . . . . .	7,622	8 412	8,811	381,124	420,595	440,541	91	86
Brazil . . . . .	21,605	20,159	19,385	1,080,000	1,007,900	969,247	107	111
Cuba . . . . .	60,480	69,906	104,428	3,024,000	3,495,292	5,221,343	86	58
Ecuador . . . . .	423	425	432	21,160	21,800	21,577	99	98
United States . . . . .	3,120	3,674	1,911	156,000	183,693	95,575	85	163
Gnadeloupe . . . . .	816	375	542	41,000	19,000	27,100	218	150
British Guiana . . . . .	2,639	2,826	2,570	131,900	141,280	128,504	93	103
Jamaica . . . . .	1,477	1,279	1,329	74,000	64,000	66,438	115	111
Mexico . . . . .	5,290	5,247	4,242	265,000	262,000	212,109	101	125
Peru . . . . .	10,196	9,480	8,009	509,800	470,000	400,458	108	127
Porto Rico . . . . .	18,977	15,673	13,716	948,900	753,664	685,809	121	138
Dominican Republic . . . . .	8,497	8,125	7,707	424,850	406,237	385,339	105	110
El Salvador . . . . .	666	1,024	507	33,289	51,210	25,353	65	131
Total, America . . . .	141,805	146,605	173,589	7,091,000	7,326,700	5,679,393	97	82
ASIA.								
Formosa . . . . .	20,463	17,577	13,629	1,023,155	878,841	681,427	116	150
India . . . . .	86,912	72,083	66,618	4,346,000	3,604,000	3,380,880	121	130
Japan . . . . .	2,072	1,714	1,821	103,586	85,676	91,040	121	114
Java . . . . .	54,565	62,733	57,172	2,728,000	3,136,602	2,858,554	87	95
Philippine Is. . . . .	18,980	18,796	16,404	950,000	939,771	820,180	101	116
Total, Asia . . . .	182,972	172,907	155,641	9,151,000	8,644,890	7,782,081	106	118
AFRICA.								
Egypt . . . . .	3,197	2,685	2,094	159,800	134,300	104,691	119	153
Mauritius . . . . .	3,858	4,871	5,041	193,000	243,560	252,045	79	77
Mozambique . . . . .	3,417	1,907	1,622	171,000	95,300	81,076	179	211
Reunion . . . . .	946	1,111	1,116	47,312	55,567	55,775	85	85
Union of S. Africa . . . . .	6,518	7,890	5,297	325,900	393,000	264,868	83	123
Total, Africa . . . .	17,936	18,434	15,170	897,000	921,727	758,455	97	118
OCEANIA.								
Australia . . . . .	13,149	11,927	11,283	657,000	596,374	564,162	110	116
Hawaii . . . . .	19,960	19,160	17,340	998,000	958,000	867,007	104	115
Fiji Is. . . . .	1,819	2,019	2,002	90,900	101,000	100,083	90	91
Japanese mandated territ. . . . .	964	850	279	48,175	42,513	13,950	113	345
Total, Oceania . . . .	35,892	33,956	30,904	1,794,000	1,697,887	1,545,202	106	116
General Totals . . . .	378,608	371,898	375,307	18,933,000	18,591,204	18,765,131	102	101

(1) Approximate data.

*Union of South Africa* : The March cane reports showed some improvement in crop condition, which was 10 % below normal. Rainfall in March was well-distributed and temperature continued favourable for growth.

**VINES**

In the northern hemisphere weather has not so far been very favourable to growth.

On the whole the vines have supported the winter cold fairly well. On the other hand the frosts in April caused more important damage in the Mediterranean basin, especially in Algeria and, to a less extent, in Spain, in the South of France and in Italy. Losses through frost, of which the danger is now past in the southern regions, do not, however, seem to have had any considerable effect on the total crop.

The drought which was rather serious toward the end of the winter in the Mediterranean basin as a whole was ended in Spain by fairly abundant precipitation, which led

to a recovery in that country, but it persisted in Algeria generally, causing some anxiety for the future of the crop.

In all the vine regions of Europe except in Spain, March and April were marked by persistence of winter conditions, which retarded growth for two or three weeks. The vineyards of southern France were beginning to suffer toward 10 May from the abnormal cold and excessive humidity, while in Italy the return of fine weather at the beginning of May stimulated a rapid advance in growth which may have made up for the delay. In the northern vine areas the retardation of growth may be considered rather as an advantage since the vines thus avoided the late frosts and it has been favourable to their later development.

The abundant soil moisture favours development of cryptogamic diseases, which are to be feared with the return of the warm weather and growers in the southern regions were already preoccupied with this possibility; from the end of April anti-cryptogamic treatment had become general in the south of France and in some parts of Italy but in the latter country were hindered, as in Spain, by the unsatisfactory economic position of the growers. So far insects have not appeared to any disquieting extent; the cold spring seems to have considerably reduced fears of invasion.

It is too soon to judge, at least in most cases, the proportion of the fruit so far set but it seems generally average.

On the whole, without being distinctly good, condition of the vines is fairly satisfactory and if later conditions are favourable a good crop may be hoped for.

*The commercial position* has scarcely changed since the beginning of March. In North Africa available supplies are exhausted; movement is normal in Italy and Spain, though, especially in the latter country, the considerable slackening of exports to France limits it almost entirely to the supply of the internal market; in France it is still difficult. Apart from a few rare cases in Italy and Spain, where business has shown temporary activity, quietness continues to reign over the wine market as a whole.

*Prices* have undergone only feeble oscillations but, while in Spain and Rumania they have a rising tendency, in Italy, after a rise in April and especially in France, the movement is downward and equal to selling prices tend to a level or even lower than cost of production.

In the *southern hemisphere* the Australian crop is average. The estimate for the Union of South Africa appears to be smaller owing to the abnormal conditions preceding the vintage in February so that production may be about the level of last year if not lower; and may thus be about average. From Chili it is reported that there exist heavy stocks from old crops, amounting to 33 million Imp. gall. (40 million Amer. gall.).

P. DE V.

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*Austria*: Development was hindered by cold weather in April. Crop condition was 2.4 on 1 May against 2.6 on 1 April this year and 2.3 on 1 May 1931.

*France*: The weather until about May 10 was characterised by the persistence of low temperatures, excessive humidity and the absence of sunshine, conditions quite abnormal for the region. Sharp frosts occurred locally on April 21 but although they caused important damage in some vineyards, their effects on the crop as a whole do not appear to be very large. The period of frosts has now passed.

The vines are everywhere backward in growth but the bad weather is arousing some anxiety only in the southwestern areas, especially Bordelais; in the northern vineyards the check to growth is considered to be a somewhat favourable factor as regards future development. Fruit formation is generally normal.

In the southern vineyards, the excessive humidity will encourage mildew as soon as the temperature becomes normal for the season ; the first spots were noticed at the beginning of May and preventive measures have been carefully taken. Until now, no appreciable insect damage has been caused ; imagos of vine pyralid and eudernis are rare.

The soil has generally been well prepared.

Unless there is an eventual occurrence of cryptogamic disease, the appearance and extension of the vineyards may be taken to indicate a good crop.

The 1931 crop is being sold with difficulty despite a relatively high consumption. A business recovery is, however, generally anticipated and should be facilitated by the further fall in prices at the end of April and the beginning of May ; the disinclination of vine growers to sell their crops seems to be weakening.

*Hungary* : Late frosts caused damage in some vineyards. The more copious rains of the first week of May greatly stimulated growth. Some damage by hail and insects is also reported.

*Italy* : Setting was observed to have taken place regularly in April.

*Luxembourg* : The vine area for 1932 is 3,100 acres compared with 2,750 in 1931 and 3,470 on the average for the preceding five years ; percentages : 112.9 and 89.4.

*Rumania* : The vines have wintered well.

*Palestine* : The setting of the fruit is below normal. Crop condition as at 1st May was fair. Flowering is taking place under poor conditions. Yield prospects are poor owing to prolonged drought.

*Algeria* : The severe frosts in April caused serious damage ; private estimates place the loss at up to 44 million Imp. gall. (53 million Amer. gall). but it is still too early to make such a precise estimate. Owing to the persistent drought since the beginning of March, interrupted only by some showers of which the most important were at the end of April, soil moisture is very low, though this is partly compensated for by surface cultivations.

Towards the end of April crop condition was 90, that is, below average, against 100 at the same date last year.

Budding has been on the whole copious ; flowering began on earlier stocks under favourable conditions. Field work and measures against fungi and insects were actively carried out in favourable weather. So far the vines had been free of disease.

The area at present in bearing is estimate at 778,000 acres, an increase of scarcely 0.6 % on the declared area of last year's vintage. Normally the estimate made in April-May does not take into account the areas coming into bearing in the current year which should bring an increase of about 25,000 acres at least, on the basis of plantings in spring 1929.

The markets remain quiet but movement of available supplies seems not too difficult. Prices are stationary.

*Cyrenaica* : The vines are flowering under good conditions.

*French Morocco* : The alternation in April of sunny days and damp nights, favoured the pruning and flowering of vines ; fruit formed plentifully ; the weather conditions, especially the misty mornings followed by high day temperatures are fairly favourable for the development of cryptogamic disease but treatments have been carefully applied and so far no signs of disease have appeared. Moreover, abundant precipitation since the middle of March has made up for the deficiency of soil moisture. The present conditions are therefore favourable for the formation of a good crop.

*Tunis* : April was a favourable month for the vines and their present appearance gives rise to hopes of a good crop.

*Australia* : Production of wine is officially estimated at about 13,200,000 Imp. gall. (15,850,000 Amer. gall.), considerably below the average and a little above the production of 1931.

The poor crop is due partly to severe frosts, partly to damage caused by thrips but especially to the prolonged drought from September to May, which greatly lowered the excellent prospects of the beginning of the year, especially for unirrigated vines. The rains in February were very favourable to quality, which is good on the whole.

Stocks of old crop are considerably above the already large stocks existing at the end of the 1930-31 and 1929-30 seasons, but exports show a tendency to increase and the crop being rather small, it would appear that a certain reduction of stocks in the new season may be counted on ; movement will be facilitated by the very low prices, lower than those of 1931. The prices fixed by the Minister of Commerce as a basis for the levying of duties vary for the current types of grapes, of which the must is 14-15 degrees Beaumé, according to quality and district, between £6 and £7 per metric ton.

## OLIVES

*Italy* : Budding has been good both in the Islands and in the South.

*Palestine* : The flowering of the trees is general, and it is taking place under poor conditions. Crop condition as at 1st May was fair.

*Algeria* : The olive trees have suffered from the cold, frosts and sirocco winds during April ; the abnormally small quantity of rainfall during the winter and spring and the consequently low reserves of soil moisture moreover constitute fairly unfavourable conditions for the summer growth of olives. At the beginning of May flowering was general and conditions favoured fruit formation.

*Cyrenaica* : The olives are flowering under good conditions.

*French Morocco* : April conditions were favourable for the beginning of growth. Abundant precipitation after the middle of March has made up for the previous deficiency of soil moisture.

## COTTON

*U. S. S. R.* : The area planted with cotton as on May 10 is 4,297,000 acres or 70.7 % of the plan. Last year at the same date 4,043,000 acres or 72.2 % had been planted.

*Argentina* : According to the first estimate the total area sown this year is 427,000 acres against 423,800 in 1930-31 and 243,400 acres on the average of the preceding five years. Percentages 100.8 and 175.5.

*United States* : According to telegraphic information received from the Department of Agriculture, early planted cotton made good growth in the week ended on April 29. In the following week to May 6 substantial rainfall was widespread in the cotton belt but planting made fair to satisfactory advance in many places and was active in the eastern portion of the belt. Germination and growth were unfavourably affected, however, in most sections because of low temperatures. In Texas much cotton was up to good stands in the central and southern parts of the State and some fields had come up

in southeastern Oklahoma. In Arkansas field work was inactive and early cotton made only fair progress there as well as in other Mississippi valley sections.

A later cable of May 12 stated that cotton planting was backward. In the following week to the 19th., the weather was too cool for growth.

*St. Vincent* (Brit. West Indies) : The return per acre of Sea Island cotton for the season 1931-32 will fall short of that obtained during the previous one. Insect pests were not prevalent and fungoid diseases were normal. The percentage of stained cotton will not be large. At the middle of April cotton plants throughout the island were being destroyed. There is every indication that the area under cotton for the forthcoming crop will be less than the present area.

*Cyprus* : Towards the end of April planting was in progress. Planting of both unirrigated and irrigated areas will be limited owing respectively to the shortage of rain and anticipated shortage of irrigation water.

*French West Africa* : The 1931-32 crop was on the whole good in quantity and quality despite a certain decrease in the area devoted to this crop. In the Upper Volta, on the contrary, it left something to be desired.

*Algeria* : The bushes suffered from the low temperatures.

*Egypt* : April weather was very changeable and temperatures on a certain number of days were relatively very low and accompanied by cold winds with the result that growth of late crops was greatly affected, especially in the north of the Delta. Irrigation water is sufficient. Sowings have generally been effected at the usual period except in some localities where they have been delayed by adverse weather ; at the beginning of May they had been finished everywhere. The changeability of the weather had an adverse effect on the general crops, particularly in Lower Egypt. Growth was impeded and newly germinated plants suffered from drought ; re-sowing was consequently more extensive than usual, reaching 10 % to 15 % in the northern provinces of the Delta and 4 % in the rest of the country. Thinning, hoeing, manuring and watering of early-sown areas were in progress in Upper Egypt ; in the late and general crops, hoeing and re-sowing were in progress. The area sown seems to be smaller, especially in Upper Egypt, than that fixed by the law restricting the cotton area. The cultivation of Maarad and Zagora varieties is extending.

*Nigeria* : The amount of American cotton purchased for export in 1931-32 is estimated at 18,000 centals (3,750 bales of 478 lbs) against 55,000 centals (11,590 bales) in 1930-31. The heavy reduction is chiefly due to the fact that large quantities were absorbed by the local weaving industry or were taken across the French border. The exports of native cotton from the Middle Belt amounted to about 200 centals (42 bales) ; no native cotton was exported from the Southern Provinces up to March 31st, while last year on the same date 160 centals (33 bales) had already been exported.

So far as can be judged, the yield per acre this year in the South has generally been a little lower, perhaps, by 10 %, than normal. The acreage planted was greatly reduced on account of last year's low price. The amount of "Improved Ishan" seed sold in 1931 was only 45 % of the amount sold in the previous year. Up to 31 March 1,200 centals (250 bales) of Ishan cotton had been bought as against 8,600 centals (1,790 bales) to March 31 last year. Cotton has been held up in many areas for an improvement in price and, unless that occurs, is it likely that much seed cotton will be stored and possibly even some not picked. It is anticipated that the total export of improved Ishan cotton, which was 17,200 centals (3,590 bales) in 1930-31, will be this season



be only 2,800 centals (600 bales), unless the price rises again considerably. On this basis the total quantity of cotton purchased for export in 1931-32 would not be more than 21,000 centals (4,400 bales), against 74,000 (15,400) in 1930-31 and 138,000 (28,800), the average for the five seasons 1925-26 to 1929-30. Percentages : 28 and 15 respectively.

Arrangements were made in the Northern Provinces for the distribution of over 3,000,000 lbs. of American seed, but it was being taken up so readily that the total quantity distributed will probably exceed this figure eventually. Given normal weather it is probable that the purchases of American cotton next season will be between 40,000 and 60,000 centals (8,400-12,600 bales).

*Anglo-Egyptian Sudan* : According to the latest cotton report issued by the Government at Khartum, ginned cotton production up to the end of March 1932 was 811,000 centals (170,000 bales) against 418,000 (88,000) in 1931, 509,000 (107,000) in 1930, 572,000 (120,000) in 1929 and 413,000 (86,000) in 1928. Total production is forecast at 956,000 (200,000) of ginned cotton or 88 % more than last year and 60 % above the average of the five seasons 1925-26 to 1929-30.

*Union of South Africa* : Due to unremunerative prices there has been a wholesale reduction in the area planted this season. Weather conditions have also been discouraging.

## FLAX

*Belgium* : The crop will be greatly reduced owing to the low selling prices.

*Hungary* : On 12 May sowings were still in progress. Early sowings have sprouted vigorously and uniformly.

*U. S. S. R.* : According to the Government plan, the total area to be sown to flax in the spring of the present year is 8,105,000 acres of which 6,326,000 acres for the production of fibre and seed ("dolgunetz" variety) and 1,779,000 for seed only ("kudriash" variety).

In 1931 the total area sown to flax was 7,507,000 acres of which 5,777,000 "dolgunetz" and 1,730,000 "kudriash".

According to the plan, the Government, through its various central and local organisations, should purchase from the farmers 8,267,000 centals of flax fibre and 9,259,000 centals (16,535,000 bushels) of flaxseed of the 1932 crop. Some facilitations granted to flax growers last year have been renewed.

*Canada* : According to an inquiry made by the Canadian Government, farmers intend to sow 559,000 acres to flax seed compared with 627,000 last year and 511,000 on the average for the period 1926-1930 ; percentage : 89.1 and 109.3.

*Palestine* The early-sown linseed crop will produce good yields. Late-sown crops are only fair. This crop has shown far greater resistance to drought than have cereals. Crop condition as at 1st May was poor.

## HEMP

*Hungary* : On 12 May sowings were still in progress ; those made early have sprouted vigorously and uniformly.

*Italy* : In April, the hemp crop was in good condition but a little late.

*U. S. S. R.* : According to the plan, the Government, through its various central and local organisations, should purchase 2,646,000 centals of hemp fibre and 2,425,000 centals of hemp seed of the 1932 crop. Some facilitations granted to hemp growers last years have been renewed.

### HOPS

*Belgium* : Area this season is especially small, being only 1,600 acres against 2,100 in 1931 and 3,300 on the average of the five years ending 1930. Percentages 79.5 and 49.1.

*Hungary* : At the end of the first week of May development was fairly good.

### TOBACCO

*Hungary* : The tobacco seedlings in the beds have grown well and are in healthy condition ; transplanting has begun.

*Italy* : Transplanting began in the latter half of April.

*U. S. S. R.* : According to the Government plan, the area to be planted to tobacco in the spring of the present year is 687,000 acres compared with 405,000 sown in 1931.

*Canada* : The area under tobacco in 1931 is estimated at 55,100 acres compared with 41,400 in 1930 and 37,200 on the average for the period 1925-29 ; percentages : 132.9 and 148.0. The estimate of production is 51,300,000 lbs. or rather higher than the preliminary estimate of 48,230,000 lbs published last November ; this increase on the previous estimate is due to the raised estimates for Burley and bright flue-cured tobaccos which are now 19 and 24.6 million lbs. respectively. Total production in 1931 was 39.7 % larger than in 1930 (36,717,000 lbs.) and 47.5 % above the 1925-29 average (34,774,000 lbs.)

The season in the New Belt of Ontario was most favourable with the result that the flue-cured crop has the best quality of any crop yet produced in Ontario, the leaf being generally very bright in colour with good size, body and aroma. The Old Belt flue crop suffered somewhat from drought during the growing season and late rains induced a second growth which somewhat injured the quality. Burley is of excellent quality, containing a high proportion of the bright, thin cigarette grades. The quality of the dark appears to be very good.

Despite the good quality of the crop, prices were generally lower than in 1930. Prices in 1931 compared with those for 1930 (in brackets), were as follows : Bright flue-cured : 20.8 cents per lb (32.0) ; Burley : 8.4 (15.0) ; Cigar leaf : 5.0 (9.0) ; dark air-cured 10.0 (10.0) ; dark fire-cured : 12.0 (14.0) ; large pipe : 5.0 (10.0) ; small pipe : 8.5 (16.5).

*Algeria* : Tobacco sowings have suffered from the cold and frosts but it does not seem that these unfavourable conditions will seriously affect crop results as transplanting has not yet been finished and the gaps have been immediately filled. Growth of the transplanted crop is regular.

### OTHER PRODUCTS

#### Tea.

*Ceylon* : Weather during April was wet throughout the island except in the North and North-East. Crop condition at the beginning of the month was average. Area under tea in 1932 is estimated to be 457,000 acres, 4 % less than that of 1931 (474,000 acres) and equal to the average 1926-30.

*India* : According to a report dated April 28 received from the Department of Commercial Intelligence and Statistics, in North India generally droughty conditions prevailed during March though a few districts received some well distributed rain. Immediate crop prospects depended on rainfall. A negligible amount of leaf was manufactured during March.

In South India showers set in at the end of March and crop prospects improved ; the outturn during the month showed an increase over than for the corresponding month last year and the total crop at the end of the month was ahead.

*Japan*. (Telegram of May 19) : On May 1 the crop condition of tea was rather poor

### Coffee.

*New Caledonia* : The cyclone of February has caused particularly large damage to the coffee plantations already in full production situated in a vast region of 2,200 sq. miles.

### Cacao.

*Brasil* : Transport of the 1931-32 crop in Ilheos was completed in April. Entries by rail in the Ilheos and Rio de Contas zones in March were nearly double the heaviest recorded during the same month of any previous year. Rail entries were as follows :

	March 1932	May 1931 to March 1932	March 1931	May 1930 to March 1931
Ilheos zone (1000 lb.) . . . .	7,937	101,704	1,243	61,538
Rio de Contas zone (1000 lb.).	1,587	9,608	—	2,939
	April 1932	May 1931 to April 1932	April 1931	May 1930 to April 1931
Ilheos zone (1000 lb.) . . . .	447	102,151	34	61,571
Rio de Contas zone (1000 lb.).	188	9,795	—	2,939

The prospects for the coming crop are reported to be excellent. The first entries of the forecrop were expected early in May.

Weather has been favourable; rainfall at Ilheos in April was 4 inches against the average of 9.81 inches. The aggregate rainfall from 1 January to the end of April was 30 inches (average 32 inches).

*Gold Coast* : The general opinion of officers in the districts is that owing to the general shortage of cash, picking of the last pods has been more thorough than in previous seasons. While it is not possible to give any reliable estimate of the extra quantities made available by this close picking, there is definite evidence that production has been larger than it would have been in normal circumstances. The latest districts completed marketing in March and the quantity remaining in farmers' hands was negligible. The January estimate of production in Ashanti and the Colony at 421 million pounds is likely to prove correct if shipments during April and May are at normal rates. As merchants begin shipping major crop cacao in September and during the current season 125 million pounds

were shipped in that month, apart from the 9 million pounds carried over from the previous minor crop, the former quantity must be added to shipments since 1 October in arriving at the correct figure for major crop production.

Up to the end of March about 6.7 million pounds had crossed the Volta River at Senchi for shipment ; of this quantity half was produced in British Togoland and is not included in the estimate. Nearly 11.2 million pounds had been exported over the frontier to French Togoland.

Crop movement has been as follows :

	March 1932	October 1931 to March 1932	March 1931	October 1930 to March 1931
Arrivals by rail at Takoradi and Accra (1000 lb.) . . . . .	7,002	244,084	40,853	246,557
Shipments from Takoradi and Accra (1000 lb.) . . . . .	35,282	294,892	73,237	273,396
Shipments from all ports (1000 lb.) .	43,785	364,468	93,316	334,351
Stocks at Takoradi and Accra beach at end of March (1000 lb.) . .	20,465	—	...	—

Total stocks in the country are reputed to be 82.9 million pounds but how much of this will be shipped before the end of May depends entirely on individual marketing arrangements. The explanation of this large figure is either that production this season was higher than anticipated or that the carryover of major crop cacao after the end of May in previous seasons was higher than calculated.

The minor crop throughout the country is much later than normal and small. This year the mid crop is also likely to be extremely small in most districts. Flowering was very late and while pods were setting the first flowers for the next major crop were appearing. It is likely therefore that the two crops will merge to form an early major season.

### Groundnuts.

*U. S. S. R.* : According to the Government plan, the area to be sown to groundnuts in the spring of the present year is 40,000 acres compared with 11,000 sown in 1931.

*Argentina* : The harvest has been carried out under good conditions but yields in the principal centres of production are generally low owing to the summer drought and losses due to "isoca".

*French West Africa* : The 1931 groundnut crop in the Upper Volta was very good and nearly as large as that of the preceding year, which exceeded 1,100,000 centals.

*Egypt* : The weather has been favourable for the sowing of groundnuts. Germination is satisfactory.

*Union of South Africa* : The severe drought in the Northern Transvaal is the chief cause of the poor crop this season. Production is estimated at 83,200 centals, an increase of 2.6 % on that of 1930-31, but a decrease of 31.3 % on the average of the five years ending 1929-30.

### Jute.

*India* : Light to moderate rains in the latter half of April in Bengal facilitated jute sowings, which continued in full swing. In the first ten days of May rainfall was heavy in parts of West and East Bengal ; elsewhere it was light to moderate, benefiting standing crops generally. Sowings were far advanced in East Bengal but elsewhere more rain was needed, especially in North Bengal.

### Colza, sesame and mustard.

*Austria* : At the beginning of May colza was beginning to flower. In Styria the crop suffered considerably from the damp cold. Crop condition on 1 May was 3.1 as on 1 April this year, against 2.5 on 1 May 1931.

*Hungary* : The colza crop is growing slowly and is short in stature and thin. On about 10 May the plants were in flower. Owing to winter damage, re-sowing has been necessary in various districts. In most of the provinces crop condition is below the average.

*Netherlands* : Weather conditions are summarised under " Cereals ". Crop condition of colza on 22 April was good to very good in the north but only fairly good to good in the south. Development is everywhere a little backward.

*Rumania* : The winter frosts have destroyed a good part of the winter colza sowings in the Danube valley and Dobruja.

*U. S. S. R.* : According to the Government plan, the area to be sown to sesame in the spring of the present year is 432,000 acres against 243,000 sown in 1931; and that to be sown to mustard in the spring of the current year, is 882,000 acres against 741,000 sown in 1931.

*Palestine* : A very small area has been sown with sesame. Some areas prepared for *dura* are now being sown with sesame, but the total areas under this crop will not be appreciably increased. Some germination is noted in parts of Northern Palestine. Sowing is still being proceeded with in certain areas. Crop condition as at 1st May was poor.

### Sericulture.

*Italy* : Budding of mulberries, and consequently incubations and distribution of eggs were retarded by the weather. Condition of mulberries is so far good and save for sporadic cases disease is not reported. Owing to the considerable delay in rearings sufficient data for forecasts are not available. It is known meanwhile that while considerable reductions have occurred in some areas, a slight increase is to be expected, especially in hill districts.

*Japan* : Eggs incubated this year are expected to be 10-15 % below the number of last year.

On May 1 condition of mulberries was bad ; 2,589,000 ounces of spring eggs had been placed in incubation against 2,807,000 at the same date in 1931 and 2,615,000, the average of the five years ending 1930. Percentages : 92.2 and 99.0.

## TOTALS OF WORLD AGRICULTURAL PRODUCTION

The following totals have been obtained from the data in the tables published for each product in January, which have been revised and completed. With the name of each product is indicated the number of countries for which data for 1931 are at present available and also the percentage of their total production in 1930 to world production in the same year as published in the 1930-31 Yearbook, when they comprised nearly all producing countries.

Crop, number of countries comprised in the total, and percentages of world production	AREA					PRODUCTION								
	1931  and  1931-32	1930  and  1930-31	Average 1925 to 1929	Percentages for 1931 and 1931-32		BRITISH WEIGHTS			AMERICAN WEIGHTS			Percentages for 1931 and 1931-32		
			1930 and 1930- 1931 to 1929-30	1930 and 1930- 1931 = 100	Average age = 100	1931 and  1931-32	1930 and  1930-31	Average 1925 to 1929 and 1925-26 to 1929-30	1931 and  1931-32	1930 and  1930-31	Average 1925 to 1929 and 1925-26 to 1929-30	1930 and 1930- 1931 = 100	Average = 100	
thousand acres		%	%	thousand centials							%	%		
Wheat (49 countr. 100.0 %) . . . a)	248,472	253,410	237,136	96.1	102.7	2,213,497	2,253,198	2,146,478	thousand bushels (60 pounds)	3,689,088	3,755,255	3,577,898	98.2	103.1
Rye (30 countries 100.0 %) . . . . a)	46,281	49,049	47,396	94.4	97.6	460,880	557,835	525,771	thousand bushels (56 pounds)	823,002	996,137	938,880	82.6	87.7
Barley (42 countr. 90.0 %) . . . . a)	59,351	62,469	57,057	95.0	104.0	589,042	693,621	641,871	thousand bushels (48 pounds)	1,227,192	1,445,069	1,337,256	84.9	91.8
Oats (37 countries 96.0 %) . . . . a)	101,075	103,057	104,517	98.1	96.7	1,050,001	1,126,685	1,170,105	thousand bushels (32 pounds)	3,281,231	3,520,860	3,656,558	98.2	89.7
Maize (26 countries 84.0 %) . . . . a)	166,272	159,355	155,211	104.3	107.1	2,058,245	1,823,473	2,145,024	thousand bushels (56 pounds)	3,675,440	3,265,128	3,830,411	112.6	96.0
Rice (rough) (16 countr. 93.0 %) a)	134,800	125,045	120,940	99.6	103.0	1,786,227	1,837,184	1,719,497	thousand bushels (45 pounds)	3,969,813	4,082,550	3,821,028	97.2	103.9
Potatoes (33 countr. 96.0 %) . . . . a)	30,375	29,599	29,352	102.6	103.5	3,229,148	3,251,245	2,968,556	thousand bushels (60 pounds)	5,381,800	5,418,634	4,939,162	99.3	109.0
Sugar-beet { 18 countr. a) 19 countries 97.0 % . b)	4,520	5,315	5,145	85.0	87.8	1,021,035	1,349,659	1,067,691	thousand short tons	51,051	67,482	53,384	75.7	95.6
	7,853	7,848	6,771	100.1	116.0	1,329,683	1,684,098	1,253,958	thousand bales (478 pounds net)	66,483	84,208	62,697	79.0	106.0
Cotton ginned (16 countr. 98.0 % . b)	72,929	78,494	78,966	92.9	92.4	115,822	109,614	114,945	thousand bales (478 pounds net)	24,231	22,932	24,047	105.7	100.8
Linseed (13 countr. 99.0 %) . . . . a)	15,901	15,983	14,982	99.5	106.1	70,378	69,408	69,545	thousand bushels (56 pounds)	125,676	123,944	124,188	101.4	101.2
Flax (fibre) (13 countr. 76.0 %) a)	692	914	959	75.7	72.2	2,220	3,318	4,096	thousand pounds	222,006	331,797	409,620	66.9	54.2
Hemp (fibre) (8 countr. 60.0 %) . a)	297	356	388	88.3	78.4	1,936	2,901	3,179	thousand pounds	193,567	290,129	317,908	66.7	80.9
Hemp seed (7 coun- tries 72.0 %) . .	292	351	381	83.1	76.6	714	794	862	thousand pounds	71,430	79,367	86,201	90.0	82.0
Tobacco (10 coun- tries 65.0 %) . a)	2,560	2,691	2,335	95.1	109.6	20,988	21,667	18,662	thousand American gallons	2,098,808	2,166,710	1,866,219	96.9	112.5
Hops (8 c. 94.0 %).	111	126	146	88.2	76.3	928	1,221	1,270	thousand American gallons	92,815	122,137	126,987	76.0	73.1
Olive oil (6 countr. 96.0 %) . . . . .	—	—	—	—	—	18,160	8,640	17,592	thousand American gallons	238,626	113,534	231,210	210.2	103.2
Vines (15 c. 83.0 %).	—	—	—	—	—	(1) 3,178,448 (2) 2,834,010 (3) 3,170,688	(1) 3,170,688 (2) 2,834,010 (3) 3,170,688	(1) 3,170,688 (2) 2,834,010 (3) 3,170,688	thousand pounds	(1) 3,817,030 (2) 3,403,892 (3) 3,807,705	(1) 3,817,030 (2) 3,403,892 (3) 3,807,705	112.2	100.2	
Silk (5 c. 97.0 %) .	(a) 8,769 (2) 7,453 (2) 7,411	(a) 8,769 (2) 7,453 (2) 7,411	(a) 8,769 (2) 7,453 (2) 7,411	90.8	91.3	(3) 890,404 (3) 1,037,887 (3) 898,318	(3) 890,404 (3) 1,037,887 (3) 898,318	(3) 890,404 (3) 1,037,887 (3) 898,318	thousand pounds	(3) 880,404 (3) 1,037,887 (3) 898,318	(3) 880,404 (3) 1,037,887 (3) 898,318	84.8	93.0	

a) Not including the U. S. S. R. — b) Including the U. S. S. R. — (1) Wine. — (2) Eggs in incubation. — (3) Cocoons.

## SUPPLEMENTARY FIGURES

As the production and area for most countries were published in the February number of the Monthly Crop Report and Agricultural Statistics, it is not necessary to repeat them again this month. Hence only the new data and any modifications of the figures published last month are given in continuation. In another table is shown the total world production based on the figures received up to the time of going to press.

COUNTRIES	(t) AREA						(t) PRODUCTION								
	1931	1930	Average 1925 to 1929	% 1931 1931/32			1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32		
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	1931/32	1930/31	1925/26 to 1929/30	1930 — 1930/ 1931 = 100	Aver. = 100		1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 — 1930/ 1931 = 100	Aver = 100	
	1,000 acres						1,000 centals			1,000 bushels (60 lb.)					
WHEAT.															
Uruguay . . . . .	1,154	864	1,056	133.4	109.3		7,182	4,421	7,335	11,069	7,369	12,224	162.4	97.9	
RICE (rough).										1,000 bushels (45 lb.)					
Java and Madura. a)	7,593	7,735	7,391	98.2	102.7		102,801	111,206	104,753	228,443	247,119	232,779	92.4	98.1	
b)	1,086	1,077	1,101	100.8	98.6		9,279	9,588	9,204	20,620	21,307	20,453	96.8	100.8	
POTATOES.										1,000 bushels (60 lb.)					
United States . . .	3,382	3,038	3,054	111.3	110.7		225,749	190,926	209,819	376,248	333,210	349,698	112.9	107.6	
Union of South Afr.	...	...	78	...	...		3,358	2,760	2,730	5,597	4,600	4,551	121.7	123.0	
COTTON (ginned)										1,000 bales (478 lb. net)					
United States . . .	40,693	45,091	44,882	90.2	90.7		81,719	66,595	72,983	17,096	13,932	15,268	122.7	112.0	
India . . . . .	23,522	23,812	26,192	98.8	89.8		16,256	20,896	22,580	3,401	4,372	4,724	77.8	72.0	
Union of South Afr.	14	31	62	45.3	22.9		17	32	43	4	7	9	54.0	39.7	
GROUNDNUTS										1,000 pounds					
Java and Madura .	474	553	511	85.7	92.7		3,113	3,655	3,301	311,294	356,528	330,121	85.2	94.3	
a) Irrigated crop. — b) Unirrigated crop.															

## FODDER CROPS

*Germany*: The growth of permanent meadows, pastures, clover and alfalfa during the last weeks of April was good due to the warmer weather. Towards the end of April the sowing of beet was in progress.

The proportion of the crops abandoned due to winter damage, expressed as a percentage of the area sown, is 0.7 (against 4.3 last year) for clover and 0.7 (8.1) for alfalfa.

At the beginning of May the crop condition of the principal fodder crops was as follows: Clover 2.8 (against 3.1 at the beginning of May 1931); alfalfa 2.8 (3.1), irrigated meadows 2.9 (2.9), permanent meadows 3.0 (3.1).

*Austria*: The mid-April rains were very beneficial but development was further hindered early in May by lack of moisture. Grass on permanent meadows and pastures

is very low, but cattle have had to be pastured owing to scarcity of dry fodder. Alpine pastures were still everywhere under snow. On 1 May crop condition of the main crops was as follows : red clover 2.8 (against 3.0 on 1 April 1932 and 2.6 on 1 May 1931) ; lucerne 2.8 (3.0, 3.0), mixed clover 2.7 (2.8, 2.5), permanent meadows 2.7 (2.9, 2.8) and pastures 2.8 (3.2, 3.0).

*Belgium* : The fields of fodder crops (meadows, clover, etc.) are greening again and have greatly improved in condition but their growth is very backward. The pastures are not yet in a state to furnish normal feed for livestock and raise serious difficulties for farmers. The use of fertilizers is being taken up again especially the ammoniacal types, prices of which are advantageous ; less potash fertilizers are being bought, however, due to their relatively high prices.

*Irish Free State* : Weather in April was unsettled and on the whole wet and cold. Growth of meadows was checked and pastures were unusually bare.

*France* : The bad weather that lasted throughout April, with temperatures below normal, night frosts, excessive humidity and lack of warmth and insolation, was unfavourable to fodder crops.

Sown fodder crops will not be abundant this year, Spring sowings and plantings of fodder vegetables were seriously hindered in sprouting.

Growth of permanent meadows, pastures and grass also suffered but grass is fairly plentiful.

*Great Britain and Northern Ireland* : Weather in April was cold with considerable rain and nocturnal ground frosts. Cultivation was not, however, seriously interrupted, though growth was checked and warm weather was needed. Except on the heavier lands work in preparation for the drilling of roots was well advanced. Some mangolds were sown but, owing to the rain, drilling had not become general.

On temporary meadows very little growth was apparent in April but seeds were reported to be healthy and to have shown improvement during the last few days of the month. Pastures were, however, still looking very bare at the end of the month.

*Hungary* : Mangolds have sprouted fairly well. Some damage has been caused by insects. Clover and alfalfa have greatly suffered due to the rigorous winter. The new sowings have sprouted well and are growing satisfactorily. Of the other fodder crops, mixed vetches and oats are progressing normally whereas maize for green fodder and mohar are about to sprout.

Permanent meadows and pastures are very backward in growth. In general, the grass is still short but owing to the shortage of dry fodder, livestock have been turned out to graze in various localities.

*Italy* : Fodder crops improved in the latter half of April. Cutting was effected on annual grassland and "marcite" meadows and is expected to begin on permanent meadows owing to the general shortage of fodder.

*Latvia* : At the beginning of May the crop condition of clover according to the correspondents' reports was average in 27.1 % of the cases, above the average in 69.9 % and below it in 3.0 %.

*Lithuania* : In April weather favoured fodder crops. On 1 May crop condition of two year clover was 3.0 (average) and that of one-year clover 3.6 (above average).

*Netherlands* : Weather conditions are summarised under "Cereals". Vegetation of pastures and clover was hindered by cold and drought. At the end of April, however, cattle were being put on to the fields to economise fodder.



*Poland* : Weather in April was on the whole favourable. Crop condition of clover, slightly improved in respect to that of the previous month, was average, that is, the same as last year.

*Switzerland* : The bad weather at the beginning of April and the numerous night frosts caused considerable delay in growth. Only in the latter part of April, under the influence of the föhn, temperature rose again and the rains that followed brought more favourable conditions for growth. The latter is, however, very backward as compared with normal years. Pastures were late in beginning to green and even well smoked turf was unable to develop despite the recent slight improvement in the weather. Temporary grass shows bare patches in some districts. In some cases serious damage by mice is reported. A considerable delay in the commencement of pasturing is everywhere anticipated. For the country as a whole condition of fodder crops was as follows :

	1 May 1932	1 April 1932	1 May 1931
Permanent meadows . . . . .	3.8	3.5	3.5
Temporary meadows . . . . .	3.8	3.4	3.6

*Argentina* : Vegetation was delayed by the fall of volcanic ash but no serious damage was reported.

*Canada* : Crop condition of hay and clover meadows on April 30 was 90 compared with 97 at the same date of last year.

*United States* : The condition of pastures on May 1 was 74.1 compared with 78.8 on May 1, 1931 and 82.3, the ten year average for 1919-1928.

*Algeria* : Temporary meadows suffered from drought and low temperatures, frosts and scirocco at the end of April and despite the rains at that period, the appearance of the crops left much to be desired, especially in Oran. Spring sowings were also hindered by the drought.

Harvesting of permanent fodder crops was immediately after the rains at the end of April which could not therefore seriously influence yields, which are on the whole poor. Hay-making began under good conditions and quality appears good.

On the pastures the grass, without being abundant, is sufficient for feeding purposes especially after the recent rains.

*Egypt* : The weather has been favourable to the growth and maturity of clover. The fourth cutting has begun. In Upper Egypt cutting of the crop for seed has been finished.

*French Morocco* : The harvesting of fodder crops, though hindered by the weather conditions of mid-April, will give good results both in quantity and quality though inferior to those of last year.

Thanks to the abundant rains since the middle of March and other sunny days of April, pastures are in good condition.

*Tunis* : April was a favourable month for fodder crops and pastures in general.

*Union of South Africa* : Rain fell at regular intervals throughout most of the Union in March. In Natal the continuous rains from the end of January brought about a remarkable recovery of veld. In some areas, however, particularly in the Cape north-western districts and in the Northern Transvaal lowveld, precipitation was very local and in the former districts trekking in search of fresh grazing was still necessary, while droughty conditions prevailed over the greater part of the Springbok Plateau.

## LIVESTOCK AND DERIVATIVES

### Condition of Livestock and Dairy Production.

*Belgium* : Livestock are in good health.

*Irish Free State* : Pastures were unusually bare in April but reserves of hay and roots were sufficient to prevent any serious scarcity of feeding-stuffs. The reserves of fodder and grain are adequate for all reasonable requirements. Owing to the scarcity of grass milk yields were not quite up to the normal for the season.

*Great Britain and Northern Ireland* : In Scotland supplies of fodder were ample but in some districts turnips were becoming scarce. Due to the shortage of grass demand for milling offals had increased and supplies were difficult to obtain. Dried brewers' grains were scarce but other concentrated foods were plentiful and rather cheaper.

In England and Wales milk yields were maintained with difficulty but in Scotland they were normal.

*Latvia* : At the beginning of May, according to the correspondent's reports, the quantity of dry fodder available for feeding livestock until grazing time was judged to be "sufficient" in 77.4 % of the cases and "insufficient" in 22.6 %.

*Lithuania* : Owing to the fall in milk prices the use of concentrated feed has decreased considerably.

*Netherlands* : The very low milk prices have not favoured the use of concentrated feed for the dairy cows. There is little hay left and the growth of meadows is late. In general, milk production has been a little below the normal.

*United States* : At the middle of April the Department of Agriculture published a report on cattle on feed on April 1, 1932 according to which there were 16 % less cattle on feed for market in the corn belt States than on April 1, of last year. The decrease has occurred in the region west of the Mississippi River and especially west of the Missouri. Inspected shipments of stocker and feeder cattle into the corn belt for the nine months July 1931 to March 1932 inclusive were about 8 % smaller than in the corresponding period of 1930-31 and the smallest for the period in 12 years. Nearly all of this decrease occurred in the first three months of 1932 and was greater for heavy weight animals. According to feeders' reported intentions a smaller proportion should be marketed before August 1 than was the case last year.

On April 30, the Department of Agriculture issued its monthly progress report on the farm situation stating that hog slaughter in the next four months will probably be 10 to 15 % larger than the unusually small slaughter in the same months last year but that the supply of cattle for market in the next three months appears to be considerably smaller than in any recent year. A lamb crop somewhat smaller than that of last spring is expected.

In the week ended on May 6 the livestock situation in the western and northwestern grazing sections continued to show steady improvement, especially in the northern and northwestern Great Plains and the North Pacific area where ample grazing was available. It was less favourable for livestock, especially for shearing and for young lambs in central Rocky Mountain sections and the Great Basin.

Milk production per cow in the United States on April 1 was estimated at 13.65 lb. or about 5 % lower than on that date in the previous four years due to unfavourable weather during March and to less intensive feeding.

Following heavy layings of eggs and low prices during the winter, the number of eggs laid per 100 hens on April 1 this year was the lowest for that date in the last seven years.

*Palestine* : Natural grazing is very poor. Mortality due to starvation has not been reported, but animals are emaciated and weak owing to lack of sufficient nourishment. The prices of slaughter stock have dropped considerably owing to the abnormal numbers offered for sale and the poor condition of such animals. Prices of fodder have risen considerably and those dairymen who rely on purchased forage are experiencing difficulties in keeping their cows. The water supply is sufficient at present, but anxiety is felt by villagers for the future.

*French West Africa* . On the whole, the results of the livestock census of 1931 which are known for some colonies of the group show, compared with 1930, fairly considerable increases in Mauritania (10 % for sheep and goats, 5 % for cattle, 10 % for camels) and the Ivory Coast, insignificant variations in Senegal and a decrease of 10 % for sheep and goats in French Guinea.

The livestock situation was generally fairly satisfactory in the past year thank to steps taken to prevent or check epizootic disease.

Consumption and exports have considerably decreased.; prices have dropped by one-third to one-half.

*Algeria* : The livestock situation is good. Spring lambing is taking place under normal conditions.

*French Morocco* : Thanks to the very considerable improvement in feeding conditions, cattle were in a very satisfactory condition at the end of April.

*Union of South Africa* : The fairly general rains have greatly benefited grazing and have resulted in a recovery in condition of stock, especially in Natal. General condition in March was fair to good. Sheep especially were in fine condition and winter prospects were favourable. The rains appear to have been responsible for a fresh outbreak of blowfly in some districts, more especially in Eastern Cape Province ; with the advent of cool weather this menace should disappear temporarily. Winter lambing prospects were good but on account of the danger of overstocking many farmers are withholding their rams from a proportion of their ewes. It is evident that six-months wool will be shorn to a large extent this autumn.

## Livestock in Canada.

The Dominion Bureau of Statistics has now published the total figures of livestock in Canada as resulting from the new livestock survey of December 1. A summary of the data compared with those for June 1, is given below (see also November, 1931 Crop Report) :

	Cattle and calves	Hogs	Sheep and lambs
June 1, 1931(1) . . . . .	7,990,875	4,716,720	3,608,321
December 1, 1931 . . . . .	7,864,400	4,263,400	2,782,800
Net commercial marketings from			
June 1 to Nov. 1, 1930 . . . . (2) 425,168		1,376,386	433,354

(1) Excluding under 100 animals of each kind in the Yukon.

(2) Cattle 260,438 and calves 164,733 head.

The decreases recorded from June to December are largely seasonal.

According to a report published on farrowings in Canada in the period from June 1, 1931 to November 30, 1931, the number of sows farrowed was 74,408 and the number of pigs born, 674,344; of this number 548,345 pigs or 81.3 % were saved.

It is estimated that on December 1, 1931, 251,429 cows were milked in Canada, excluding Quebec, yielding a total of 3,516,535 lbs. or 13.99 lbs. per cow per day.

### World trade in eggs.

The two tables given below contain the data of trade in eggs of the most important exporting and importing countries for 1931 and 1930. As the countries considered contribute on the average about 93 % and 88 % of world exports and imports respectively, the totals indicated in the tables may be considered to represent a fairly faithful index of the movement of world trade which, in 1931 showed on the whole, only a slight decrease compared with the preceding year.

#### *International trade in eggs — Imports* (ooo lbs.).

COUNTRY	1931	1930	COUNTRY	1931	1930
Germany . . . . .	315,553	353,221	Great Brit. and North, Irel. (1)	428,585	438,853
Austria . . . . .	38,428	38,804	Italy . . . . .	54,320	50,876
Spain . . . . .	50,056	58,781	Switzerland . . . . .	34,506	30,332
France . . . . .	67,643	31,765	TOTAL . . .	989,091	1,002,082

(1) The original figures, expressed in numbers of eggs, have been converted to thousands of pounds on the basis of the coefficient 1,600 eggs = 1 metric quintal or 220.463 lbs.

#### *International trade in eggs. — Exports* (ooo lbs.).

COUNTRY	1931	1930	COUNTRY	1931	1930
Belgium . . . . .	78,093	69,454	Rumania . . . . .	30,281	37,088
Bulgaria . . . . .	49,813	42,359	U. S. S. R. . . . .	39,242	21,707
Denmark (1) . . . . .	134,251	118,806	Yugoslavia . . . . .	57,997	67,085
Irish Free State (1) . . . . .	71,155	72,817	United States (1) . . . . .	12,705	30,721
France (2) . . . . .	15,104	45,219	China (2) . . . . .	85,456	84,922
Hungary . . . . .	26,414	29,051	Turkey . . . . .	53,939	39,406
Italy . . . . .	19,807	20,551	Egypt (1) . . . . .	17,259	13,540
Netherlands . . . . .	190,037	187,290	French Morocco . . . . .	18,785	21,794
Poland . . . . .	106,033	121,500	TOTAL . . .	1,005,871	1,023,310

(1) The original figures, expressed in numbers of eggs, have been converted to thousands of pounds on the basis of the coefficient 1,600 eggs = 1 metric quintal or 220.463 lbs. — (2) Including unsweetened egg yolks for food.

Passing to an examination of the single exporting countries it is found that, of the 17 countries considered, 8 have increased their exports compared with 1930 whereas the other 9 exported less in 1931 than in 1930. In absolute quantities, the largest increases have been registered by the U. S. S. R. with 17,535,000 lbs. (following the exceptionally low figure in 1930), by Denmark with 15,445,000, by Turkey with 14,533,000 and by Belgium with 8,639,000.

Among the countries which exported less in 1931 than in 1930 are all the countries of southeastern Europe except Bulgaria. In fact, in 1931 Poland, Yugoslavia, Rumania

and Hungary together exported 33,999,000 lbs. less than in 1930 with a decrease of 13.3 %. The decrease compared with 1930 in the exports of the United States was 58.6 %.

Of the seven importing countries three increased their imports : France by 113 %, Italy by 8 % and Switzerland by 14 %.

For France and Italy, it is interesting to note how the increase in their imports in recent years has been accompanied by a simultaneous reduction in exports :

*Trade in eggs*  
(in 000 lbs).

	Italy		France	
	Imports	Exports	Imports	Exports
1926 . . . . .	15,338	47,303	14,109	32,731
1927 . . . . .	33,569	31,050	18,144	30,507
1928 . . . . .	39,450	25,814	22,545	89,547
1929 . . . . .	36,106	22,788	32,428	57,222
1930 . . . . .	50,376	20,551	31,765	45,219
1931 . . . . .	54,320	19,807	67,643	15,104

The other four importing countries have on the contrary, reduced their imports compared with 1930 ; Great Britain and Northern Ireland by 2.3 %, Germany by 10.7 %, Spain by 14.8 % and Austria by only 1 %. The decrease in the imports of Great Britain and Northern Ireland, which is the largest importer in the world, does not exceed the normal amplitude of fluctuations from one year to another. The imports of Germany, on the contrary, have followed a downward trend since 1928, due to the continued efforts of the country to increase home production and certainly, in 1930 and 1931, also to the aggravation of the economic crisis.

The number of hens in Germany has increased constantly since 1926, reaching a maximum at the end of 1930 and at the end of 1931 was only slightly below the record figure for 1930.

To bring the above figures up to date, it may be added that imports in the first quarter of 1932 indicate a very considerable fall in the quantities absorbed by the British market and also a decrease in the purchases of Austria, Spain and France ; the German imports have remained almost stationary while those of Italy and Switzerland have increased.

*Imports in the 1st Quarter*  
(in 000 lbs).

	1932	1931
Germany . . . . .	66,254	66,150
Austria . . . . .	4,938	5,823
Spain . . . . .	9,239	10,027
France . . . . .	5,331	14,695
Great Britain . . . . .	71,609	96,143
Italy . . . . .	16,887	8,770
Switzerland . . . . .	12,394	7,332
Total . . . . .	186,652	208,940

Total imports for the first quarter of 1932 are 10.7 % below those for the corresponding period of 1931.

## TRADE

COUNTRIES	MARCH				EIGHT MONTHS (August-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	589	289	0	0	4,658	1,122	0	0	3,284	0
Hungary . . . . .	108	615	0	0	6,700	4,008	0	0	5,247	0
Lithuania . . . . .	7	110	0	0	18	470	0	0	545	0
Poland . . . . .	265	137	7	4	690	1,829	331	40	1,847	49
Rumania . . . . .	...	...	...	...	(1) 19,586	(1) 6,530	(1) 4	(1) 7	9,054	9
U. S. S. R. . . . .	...	...	...	...	(2) 87,426	(2) 50,067	...	...	67,735	...
Yugoslavia . . . . .	414	0	0	0	7,255	2,760	0	0	3,247	0
Canada . . . . .	5,983	7,798	7	11	74,563	96,955	55	49	137,150	79
United States . . . . .	3,450	814	434	721	36,643	27,789	5,357	8,115	46,220	11,616
Argentina . . . . .	17,353	7,815	...	...	53,912	34,855	...	...	71,725	...
Chile . . . . .	2	2	0	0	7	425	0	0	428	0
Turkey . . . . .	159	13	0	0	646	181	0	7	265	7
Algeria . . . . .	...	...	...	...	(2) 1,501	(2) 4,632	(2) 822	(2) 88	5,706	1,371
Tunis . . . . .	214	18	26	13	1,884	1,301	320	287	3,704	542
Australia . . . . .	10,027	9,870	0	0	47,642	42,415	0	0	76,505	0
<i>Importing Countries:</i>										
Germany . . . . .	99	18	933	752	7,172	265	11,319	11,338	265	18,805
Austria . . . . .	0	0	500	401	0	84	4,572	2,961	86	5,315
Belgium . . . . .	291	150	1,903	2,458	2,787	732	19,892	19,072	2,079	31,184
Denmark . . . . .	0	0	508	216	9	20	6,691	2,632	35	4,877
Spain . . . . .	0	0	0	0	0	4	35	0	4	0
Estonia . . . . .	0	0	13	2	0	0	181	271	0	370
Irish Free State . . . . .	...	...	...	...	(1) 7	(1) 18	(1) 3,682	(1) 3,944	18	6,435
Finland . . . . .	0	0	18	11	0	0	265	55	0	90
France . . . . .	0	20	4,087	3,286	0	966	28,632	23,801	966	46,806
Gr. Brit. and N. Ir. . . . .	179	64	11,241	10,798	456	514	95,315	84,536	683	124,551
Greece . . . . .	0	0	1,382	1,149	0	0	8,491	8,662	0	14,238
Italy . . . . .	0	0	2,577	4,442	18	22	8,071	31,976	16	50,116
Latvia . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 311	(1) 736	0	1,030
Norway . . . . .	0	0	270	212	0	0	2,449	2,255	0	3,126
Netherlands . . . . .	2	190	1,361	959	93	622	11,526	11,703	683	16,568
Portugal . . . . .	...	...	...	...	...	...	...	...	...	...
Sweden . . . . .	2	2	356	180	4	20	2,566	2,327	31	2,879
Switzerland . . . . .	2	2	862	875	0	2	8,955	7,059	2	11,096
Czechoslovakia . . . . .	0	0	906	117	2	4	0,110	4,083	4	7,079
British India . . . . .	9	4	0	935	108	1,918	179	4,374	2,251	6,887
Japan . . . . .	...	...	...	...	...	...	(1) 8,045	(1) 6,724	...	15,311
Syria and Lebanon . . . . .	...	...	...	...	(1) 428	(1) 90	(1) 18	(1) 33	137	44
Egypt . . . . .	...	...	...	...	(1) 0	(1) 2	(1) 478	(1) 507	2	1,019
Union of South Africa . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 518	(2) 611	0	1,601
New Zealand . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 62	(1) 71	0	128
<b>Totals . . . . .</b>	<b>39,125</b>	<b>27,431</b>	<b>27,459</b>	<b>27,508</b>	<b>304,243</b>	<b>280,690</b>	<b>240,052</b>	<b>239,762</b>	<b>429,985</b>	<b>384,139</b>
<b>Rye. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	13	13	1,179	53	2,015	1,210	3,845	516	1,213	690
Bulgaria . . . . .	37	262	0	0	952	961	0	0	1,413	0
Hungary . . . . .	172	216	0	0	1,014	1,393	0	0	1,579	0
Lithuania . . . . .	0	53	0	0	0	146	2	0	163	0
Poland . . . . .	320	397	0	0	1,889	5,064	123	0	5,580	2
Rumania . . . . .	...	...	...	...	(1) 1,436	(1) 750	(1) 0	(1) 0	1,399	0
U. S. S. R. . . . .	...	...	...	...	(2) 17,910	(2) 9,262	...	...	15,794	...
Canada . . . . .	137	7	0	0	1,985	666	0	0	1,171	0
United States . . . . .	0	15	...	...	33	73	...	...	90	...
Argentina . . . . .	814	51	...	...	2,674	353	...	...	992	...
Turkey . . . . .	110	20	0	0	520	282	0	0	368	0
Algeria . . . . .	...	...	...	...	(2) 9	(2) 24	(2) 0	(2) 0	35	0
<i>Importing Countries:</i>										
Austria . . . . .	0	0	139	196	0	9	1,008	1,241	9	2,205
Belgium . . . . .	11	9	126	262	208	66	1,545	1,903	126	3,789
Denmark . . . . .	0	0	393	450	0	0	3,296	4,887	4	7,103
Estonia . . . . .	0	0	4	0	0	0	7	86	0	194
Finland . . . . .	0	0	2	18	0	0	331	1,230	2	1,570
France . . . . .	0	0	165	240	0	0	1,199	393	0	1,373
Italy . . . . .	0	0	13	40	0	0	88	399	0	597
Latvia . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 66	(1) 194	0	260
Norway . . . . .	0	0	196	342	0	0	2,595	2,319	0	3,023
Netherlands . . . . .	13	93	287	624	276	291	2,984	4,422	791	6,186
Sweden . . . . .	0	0	132	22	0	0	853	432	4	520
Switzerland . . . . .	0	0	7	11	0	0	62	123	0	174
Czechoslovakia . . . . .	0	0	496	0	4	458	4,665	115	476	844
<b>Totals . . . . .</b>	<b>1,627</b>	<b>1,162</b>	<b>3,075</b>	<b>2,382</b>	<b>31,013</b>	<b>21,012</b>	<b>22,679</b>	<b>18,865</b>	<b>31,409</b>	<b>28,435</b>

(1) (2) See notes page 353.

COUNTRIES	MARCH				EIGHT MONTHS (August 1-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat flour. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	7	2	24	11	53	117	152	148	123	238
Belgium	7	13	2	22	46	126	42	176	216	231
Bulgaria	139	13	0	0	542	98	0	0	220	0
Spain	2	0	0	0	15	44	0	0	75	0
France	370	465	15	35	3,757	4,149	170	421	7,350	569
Hungary	168	172	0	0	1,700	3,146	0	0	4,008	0
Italy	150	90	18	18	1,620	884	207	119	1,179	225
Latvia	...	...	...	...	0 (x)	02 (x)	0 (x)	2	73	2
Lithuania	2	2	0	0	20	15	0	0	24	0
Poland	83	71	0	2	437	500	4	15	615	24
Rumania	...	...	...	...	791 (x)	291 (x)	0 (x)	0	421	0
Yugoslavia	2	4	0	0	57	79	0	2	88	2
Canada	814	1,098	4	4	7,152	9,654	29	35	13,118	49
United States	1,171	1,402	0	0	11,881	16,541	0	2	23,164	2
Argentina	134	168	—	—	1,003	1,378	—	—	2,055	—
Chile	2	4	0	0	13	93	0	0	104	0
India	88	79	0	0	622	697	0	2	1,032	2
Turkey	2	0	0	0	2	29	4	9	29	11
Japan	...	...	...	...	1,437 (x)	1,839 (x)	75 (x)	161	3,472	212
Algeria	...	...	...	...	44 (x)	185 (x)	37 (x)	18	267	57
Tunis	11	29	0	0	82	183	16	9	251	11
Australia	1,122	899	0	0	9,797	6,645	0	0	10,404	0
<i>Importing Countries:</i>										
Austria	0	0	139	207	7	4	309	1,640	13	3,100
Denmark	0	2	101	119	9	15	974	1,129	24	1,573
Estonia	0	0	2	7	0	0	16	75	2	88
Irish Free State	...	...	...	...	20 (x)	26 (x)	2,220 (x)	2,134	40	3,686
Finland	0	0	93	108	0	0	1,164	1,552	0	2,150
Gr. Britain and N. Ir.	531	384	994	765	3,560	3,109	7,939	8,455	4,008	12,218
Greece	0	0	2	26	0	0	55	130	0	165
Norway	0	0	71	66	7	2	1,050	888	2	1,396
Netherlands	7	11	51	185	62	82	531	2,520	115	3,845
Portugal	—	—	9	22	—	—	104	180	—	215
Sweden	0	0	2	2	0	2	26	55	2	71
Czechoslovakia	0	0	139	2	7	9	791	2,388	11	2,492
Ceylon	—	—	20	24	—	—	302	306	—	445
Java and Madura	—	—	...	...	—	—	683 (x)	547	—	1,025
Indo-China	—	—	44	29	—	—	282	313	—	423
Syria and Lebanon	...	...	...	...	82 (x)	4 (x)	187 (x)	101	22	163
Egypt	...	...	...	...	0 (x)	0 (x)	1,667 (x)	2,143	0	3,580
Union of South Africa	...	...	...	...	2 (x)	7 (x)	11 (x)	181	11	205
New Zealand	...	...	...	...	2 (x)	2 (x)	121 (x)	126	2	234
<b>Totals</b>	<b>4,762</b>	<b>4,908</b>	<b>1,730</b>	<b>1,654</b>	<b>44,837</b>	<b>50,012</b>	<b>19,658</b>	<b>25,882</b>	<b>73,140</b>	<b>39,299</b>
<b>Barley. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria	2	233	0	0	397	1,382	0	0	1,598	0
Spain	0	4	0	0	4	130	0	0	152	0
Hungary	2	31	4	0	46	558	0	0	580	4
Lithuania	0	2	0	0	0	13	0	0	15	0
Poland	208	295	0	0	2,802	2,648	0	0	2,798	0
Rumania	...	...	...	...	13,056 (x)	26,764 (x)	0 (x)	0	33,797	4
Czechoslovakia	146	40	0	0	1,124	2,910	2	2	3,003	4
U. S. S. R.	...	...	...	...	15,115 (x)	17,249	—	—	28,835	—
Canada	165	220	0	0	4,081	1,612	0	0	9,240	0
United States	86	340	—	—	1,521	3,613	—	—	5,022	—
Argentina	1,770	752	—	—	5,439	3,541	—	—	5,701	—
Chile	139	53	0	0	340	370	0	0	586	0
India	71	0	0	0	298	2	0	0	306	2
Syria and Lebanon	...	...	...	...	368 (x)	414 (x)	71 (x)	4	869	7
Turkey	183	71	0	0	2,425	289	0	0	598	0
Algeria	...	...	...	...	431 (x)	1,041 (x)	1,777 (x)	4	1,444	465
Egypt	...	...	...	...	0 (x)	2 (x)	256 (x)	57	2	152
Tunis	2	4	13	37	126	165	542	290	220	396
Australia	225	209	0	0	1,356	1,168	0	0	1,552	0
<i>Importing Countries:</i>										
Germany	4	0	1,308	981	18	62	9,431	11,321	62	17,306
Austria	0	0	117	104	0	0	1,596	1,835	0	2,077
Belgium	143	189	620	802	1,151	492	7,302	7,509	1,076	10,583
Denmark	7	97	159	736	412	1,109	2,321	10,750	1,232	15,007
Estonia	0	0	0	0	0	0	0	13	0	13
Irish Free State	...	...	...	...	23 (x)	20 (x)	300 (x)	280	20	454
France	4	0	644	620	15	15	6,785	4,896	22	7,721
Gr. Britain and N. Ir.	0	83	679	1,173	9	55	11,498	14,617	68	18,601
Greece	0	0	104	4	0	0	152	78	0	79
Italy	0	0	119	79	0	0	571	576	0	773
Latvia	...	...	...	...	0 (x)	0 (x)	0 (x)	183	0	212
Norway	0	0	11	44	0	0	591	756	0	1,078
Netherlands	37	101	675	1,045	214	410	6,363	10,524	591	14,718
Switzerland	0	0	212	269	0	0	2,176	2,101	0	2,829
Yugoslavia	0	2	2	2	13	13	87	130	29	130
<b>Totals</b>	<b>5,194</b>	<b>5,655</b>	<b>4,662</b>	<b>5,694</b>	<b>50,837</b>	<b>65,997</b>	<b>52,239</b>	<b>65,486</b>	<b>33,913</b>	<b>33,257</b>

COUNTRIES	MARCH				EIGHT MONTHS (August 1-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Oats. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	2	4	4	117	7	214	181	417	220	1,005
Irish Free State . . . . .	...	...	...	...	(1) 53	(1) 201	(1) 161	157	254	452
Hungary . . . . .	0	0	0	2	4	11	2	35	13	141
Lithuania . . . . .	4	9	0	0	13	79	0	0	84	0
Poland . . . . .	7	15	0	0	26	110	0	0	137	0
Rumania . . . . .	...	...	...	...	(1) 209	(1) 1,288	(1) 0	(1) 0	1,779	0
Czechoslovakia . . . . .	68	9	0	2	419	703	55	7	710	143
U. S. S. R. . . . .	...	...	...	...	...	...	...	...	10,728	...
Yugoslavia . . . . .	0	0	0	4	0	0	0	79	2	86
Canada . . . . .	353	106	0	2	2,896	840	536	231	2,659	234
United States . . . . .	18	7	2	20	657	93	11	134	130	198
Argentina . . . . .	2,425	873	—	—	10,772	8,942	—	—	15,082	—
Chile . . . . .	18	174	0	0	137	1,175	0	0	2,178	0
Algeria . . . . .	...	...	...	...	(2) 84	(2) 642	(2) 276	(2) 108	1,292	225
Tunis . . . . .	4	35	0	0	137	421	0	9	545	9
Australia . . . . .	9	4	0	0	62	55	2	0	73	2
<i>Importing Countries:</i>										
Austria . . . . .	0	0	115	229	0	2	957	1,338	2	2,227
Belgium . . . . .	4	0	123	321	11	2	774	2,584	4	3,494
Denmark . . . . .	9	2	46	123	66	20	304	657	20	1,270
Estonia . . . . .	0	0	0	18	0	0	7	60	0	159
Finland . . . . .	2	2	0	20	18	7	40	82	7	260
France . . . . .	0	4	313	152	4	15	1,113	1,290	20	2,213
Gr. Brit. and N. Irel. . . . .	86	150	853	1,402	190	231	5,461	7,335	397	10,697
Italy . . . . .	0	0	569	249	0	0	2,568	2,798	0	3,741
Latvia . . . . .	...	...	...	...	(1) 0	(1) 4	(1) 7	(1) 18	4	57
Norway . . . . .	0	2	18	2	2	2	220	2	4	4
Netherlands . . . . .	2	141	249	500	40	271	1,581	2,421	375	3,009
Sweden . . . . .	22	9	143	101	42	33	842	644	40	1,334
Switzerland . . . . .	0	0	560	417	0	0	3,183	3,219	2	4,564
<b>Totals . . . . .</b>	<b>3,033</b>	<b>1,353</b>	<b>3,000</b>	<b>3,691</b>	<b>15,839</b>	<b>15,363</b>	<b>18,281</b>	<b>23,635</b>	<b>36,739</b>	<b>36,124</b>

**Maize. — Thousand cents (1 cental = 100 lbs).**

COUNTRIES	MARCH				FIVE MONTHS (November 1-March 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<i>Exporting Countries:</i>										
Bulgaria . . . . .	284	646	0	0	1,345	1,731	0	0	3,477	0
Rumania . . . . .	...	...	...	...	(1) 13,270	(1) 6,065	(1) 0	(1) 0	13,638	2
Yugoslavia . . . . .	207	871	4	0	1,096	4,008	34	7	0,420	24
United States . . . . .	199	258	22	46	597	633	121	388	1,336	520
Argentina . . . . .	11,442	7,628	—	—	71,075	53,173	—	—	108,983	—
Brazil . . . . .	...	...	...	...	(1) 0	(1) 11	—	—	18	—
Java and Madura . . . . .	503	406	—	—	1,466	869	—	—	2,407	—
Indo-China . . . . .	11	2	—	—	1,268	1,526	—	—	2,584	—
Syria and Lebanon . . . . .	...	...	...	...	(1) 7	(1) 77	(1) 7	(1) 9	159	49
Turkey . . . . .	44	2	0	0	106	9	0	0	212	0
Egypt . . . . .	...	...	...	...	(1) 4	(1) 2	(1) 18	(1) 22	4	298
Union of South Africa . . . . .	...	...	...	...	(2) 1,241	(2) 972	(2) 0	(2) 0	3,298	0
<i>Importing Countries:</i>										
Germany . . . . .	0	0	1,107	470	0	0	5,906	2,873	0	10,007
Austria . . . . .	0	0	401	390	0	0	3,197	2,004	2	6,270
Belgium . . . . .	337	60	924	1,268	657	260	3,497	6,030	955	17,075
Denmark . . . . .	0	0	1,265	717	0	0	9,079	3,512	0	13,539
Spain . . . . .	0	0	1,118	873	0	0	3,424	1,658	0	3,666
Irish Free State . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 3,942	(1) 2,948	26	12,044
Finland . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 190	(1) 88	0	355
France . . . . .	7	7	1,614	1,102	13	29	10,437	8,702	40	23,755
Gr. Brit. and N. Irel. . . . .	258	223	3,468	4,118	1,177	1,012	30,849	21,583	2,407	53,281
Greece . . . . .	0	0	774	24	0	0	2,478	51	0	373
Hungary . . . . .	4	18	29	185	53	194	243	428	240	2,337
Italy . . . . .	0	0	1,285	924	2	4	5,736	5,650	7	17,447
Norway . . . . .	0	0	196	613	0	0	1,781	1,627	0	3,977
Netherlands . . . . .	51	20	3,087	2,480	99	161	19,211	13,056	273	32,441
Poland . . . . .	0	0	0	13	0	0	51	95	0	496
Portugal . . . . .	—	—	60	93	—	—	456	966	—	1,605
Sweden . . . . .	0	0	421	571	0	0	2,608	2,443	0	7,311
Switzerland . . . . .	0	0	269	247	0	0	1,720	1,431	2	3,611
Czechoslovakia . . . . .	0	0	369	1,107	0	0	5,753	4,015	2	13,115
Canada . . . . .	0	0	95	243	4	4	2,280	1,953	9	4,760
Japan . . . . .	—	—	...	...	—	—	(1) 712	(1) 386	—	1,689
Tunis . . . . .	0	0	99	57	0	0	302	203	9	298
<b>Totals . . . . .</b>	<b>13,247</b>	<b>10,141</b>	<b>16,663</b>	<b>15,061</b>	<b>93,460</b>	<b>70,790</b>	<b>119,007</b>	<b>83,126</b>	<b>241,506</b>	<b>230,345</b>

(1) (2) See notes page 353.



COUNTRIES	MARCH				THREE MONTHS (January 1-March 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1932	1931	1932	1931	1931	1931
<b>Rice. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Spain . . . . .	190	57	0	0	335	146	0	0	333	0
Italy . . . . .	324	291	4	2	1,155	1,074	11	4	3,109	53
United States . . . . .	265	214	26	46	617	849	75	180	2,771	328
Brazil . . . . .	...	...	—	—	(x) 119	(x) 64	—	—	1,993	—
India . . . . .	8,250	6,155	31	60	17,547	12,816	86	71	48,442	692
Indo-China . . . . .	2,489	2,304	—	—	9,938	4,731	—	—	21,153	—
Siam . . . . .	3,516	2,458	—	—	8,007	6,583	—	—	24,318	—
Egypt . . . . .	...	...	...	...	(x) 37	(x) 198	(x) 194	(x) 15	686	836
<i>Importing Countries:</i>										
Germany . . . . .	42	55	414	295	203	168	1,437	750	1,373	8,962
Austria . . . . .	0	0	40	51	0	0	121	150	0	756
Belgium . . . . .	15	13	117	137	68	37	247	231	190	1,349
Denmark . . . . .	0	0	11	11	0	0	26	37	0	157
Estonia . . . . .	—	—	2	2	—	—	4	4	—	23
Irish Free State . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 7	(x) 9	0	53
France . . . . .	49	66	514	328	190	201	1,407	996	937	6,792
Gr. Brit. and N. Irel. . . . .	31	24	317	256	66	57	670	518	271	2,690
Greece . . . . .	—	—	49	46	—	—	143	130	—	540
Hungary . . . . .	0	0	29	29	0	0	95	82	2	431
Latvia . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 2	(x) 24	0	82
Lithuania . . . . .	0	0	2	2	0	0	0	7	0	22
Norway . . . . .	0	0	4	11	0	0	13	24	0	117
Netherlands . . . . .	148	265	71	115	430	542	181	419	2,480	4,993
Poland . . . . .	15	4	2	2	71	22	20	4	606	1,726
Portugal . . . . .	—	—	112	40	—	—	207	97	—	613
Sweden . . . . .	—	—	0	0	—	—	0	0	—	123
Switzerland . . . . .	0	0	20	33	0	0	101	104	0	454
Czechoslovakia . . . . .	0	0	37	57	0	0	185	141	0	1,127
Yugoslavia . . . . .	0	0	13	37	0	0	132	115	4	511
Canada . . . . .	0	0	117	84	0	0	183	223	0	710
Chile . . . . .	—	—	44	53	—	—	95	130	—	441
Ceylon . . . . .	0	0	1,116	924	0	2	3,234	2,739	18	10,196
Java and Madura . . . . .	...	...	...	...	(x) 11	(x) 37	(x) 1,078	(x) 1,300	232	6,327
Japan . . . . .	...	...	...	...	(x) 13	(x) 593	(x) 265	(x) 256	4,195	2,773
Syria and Lebanon . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 55	(x) 44	0	322
Turkey . . . . .	0	0	9	13	0	0	18	40	0	183
Algeria . . . . .	...	...	...	...	...	...	...	...	(4) 2	(4) 134
Tunis . . . . .	0	0	4	0	0	0	20	7	0	31
Union of S. Africa . . . . .	...	...	...	...	...	...	...	...	...	1,025
Australia . . . . .	7	11	7	2	31	31	13	11	161	29
New Zealand . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 11	(x) 9	0	73
<b>Totals . . . . .</b>	<b>15,341</b>	<b>11,918</b>	<b>3,112</b>	<b>2,636</b>	<b>35,538</b>	<b>28,153</b>	<b>10,340</b>	<b>8,940</b>	<b>114,276</b>	<b>55,704</b>
<b>Linseed. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Estonia . . . . .	0	0	0	0	0	2	0	0	4	0
Lithuania . . . . .	20	24	0	0	79	104	0	0	247	0
Argentina . . . . .	5,494	3,957	—	—	14,454	14,112	—	—	41,454	—
India . . . . .	130	119	0	0	459	280	0	0	2,515	0
Tunis . . . . .	2	0	0	0	2	0	0	0	4	0
<i>Importing Countries:</i>										
Germany . . . . .	0	2	902	1,008	4	4	1,841	2,083	13	7,507
Belgium . . . . .	15	7	417	414	88	18	1,034	1,023	205	3,702
Denmark . . . . .	—	—	57	29	—	—	108	99	—	417
Spain . . . . .	—	—	46	35	—	—	82	97	—	465
Finland . . . . .	0	0	7	13	0	0	13	24	0	68
France . . . . .	0	7	450	507	2	9	933	1,041	18	5,814
Gr. Brit. and N. Irel. . . . .	0	2	902	1,124	0	2	2,150	2,218	4	7,599
Greece . . . . .	0	0	7	4	0	0	13	20	0	95
Hungary . . . . .	0	2	0	0	2	2	0	2	42	2
Italy . . . . .	0	0	97	84	0	0	313	247	0	1,361
Latvia . . . . .	...	...	...	...	(x) 15	(x) 33	(x) 4	(x) 18	106	90
Norway . . . . .	0	0	37	68	0	0	77	134	0	289
Netherlands . . . . .	7	13	1,235	1,149	62	22	2,778	2,191	49	9,253
Poland . . . . .	0	0	11	24	2	2	29	33	7	273
Sweden . . . . .	—	—	123	126	—	—	220	238	—	1,056
Czechoslovakia . . . . .	2	0	15	46	2	2	77	71	7	582
Yugoslavia . . . . .	0	0	0	33	0	0	0	44	0	128
Canada . . . . .	0	0	22	0	2	2	22	0	584	194
United States . . . . .	—	—	417	734	—	—	1,437	1,466	—	8,109
Japan . . . . .	—	—	—	—	—	(x) 57	(x) 7	24	—	185
Australia . . . . .	0	0	13	7	0	0	194	143	0	291
<b>Totals . . . . .</b>	<b>5,672</b>	<b>4,133</b>	<b>4,758</b>	<b>5,405</b>	<b>15,173</b>	<b>14,594</b>	<b>11,432</b>	<b>11,211</b>	<b>45,359</b>	<b>47,468</b>

(x) (4) See notes page 353.

COUNTRIES	MARCH				THREE MONTHS (January 1-March 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1932	1931	1932	1931	1931	1931
<b>Butter. — (Thousand lbs.).</b>										
<i>Exporting Countries:</i>										
Austria . . . . .	55	227	2	22	238	1,076	26	26	2,362	1,565
Denmark . . . . .	27,395	28,733	51	132	82,058	86,688	370	190	378,429	1,596
Estonia . . . . .	1,012	1,378	0	0	3,142	3,878	0	0	31,844	0
Irish Free State . . . . .	...	...	...	...	(x) 500	(x) 580	(x) 1,045	(x) 1,896	42,307	3,325
Finland . . . . .	2,884	3,444	0	0	9,198	9,795	0	0	38,367	0
Hungary . . . . .	194	78	0	0	1,009	470	0	0	4,065	117
Latvia . . . . .	...	...	...	...	(x) 4,108	(x) 4,090	(x) 0	(x) 4	41,313	24
Lithuania . . . . .	767	827	0	0	1,737	2,033	0	0	19,191	0
Netherlands . . . . .	4,213	6,259	677	287	8,431	15,280	6,978	1,792	72,660	8,887
Poland . . . . .	90	1,620	9	0	1,250	5,013	9	2	27,470	31
Sweden . . . . .	2,557	4,010	0	0	8,706	12,957	11	2	49,162	40
U. S. S. R. . . . .	...	...	...	...	...	...	...	...	68,024	...
Argentina . . . . .	7,386	5,293	...	...	21,213	20,516	...	...	51,167	...
India . . . . .	26	33	35	26	79	126	121	73	364	844
Syria and Lebanon . . . . .	...	...	...	...	(x) 79	(x) 377	(x) 249	(x) 13	1,817	344
Australia . . . . .	15,036	19,670	0	0	63,749	55,237	0	0	208,924	0
New Zealand . . . . .	14,605	25,172	...	...	62,574	71,807	...	...	220,814	...
<i>Importing Countries:</i>										
Germany . . . . .	24	29	13,592	15,225	40	75	45,215	49,439	269	220,950
Belgium . . . . .	254	196	5,044	3,303	452	558	17,408	10,298	2,756	41,562
Spain . . . . .	2	4	11	4	18	22	22	11	88	121
France . . . . .	494	690	4,548	6,678	1,814	2,388	7,194	16,962	11,036	40,836
Gr. Brit. and N. Irel. . . . .	7,244	5,397	73,469	63,008	24,515	16,716	234,650	205,531	40,223	903,967
Greece . . . . .	...	...	...	...	86	...	514	302	2,059	...
Italy . . . . .	110	99	642	1,340	203	229	2,500	2,826	1,290	6,188
Norway . . . . .	351	260	4	11	1,184	547	11	55	1,629	379
Switzerland . . . . .	0	0	1,750	2,059	2	2	4,206	5,474	20	28,358
Czechoslovakia . . . . .	0	15	287	20	26	295	355	40	661	4,107
Canada . . . . .	152	64	95	1,182	410	172	157	2,099	10,681	2,322
United States . . . . .	139	225	82	99	390	501	344	306	2,004	1,833
Ceylon . . . . .	...	...	37	51	...	...	140	157	...	642
Java and Madura . . . . .	...	...	...	...	...	...	(x) 1,193	(x) 1,722	...	8,514
Japan . . . . .	...	...	...	...	...	...	(x) 33	(x) 53	...	231
Algeria . . . . .	...	...	...	...	...	...	...	...	(4) 66	(4) 4,237
Egypt . . . . .	...	...	...	...	(x) 126	(x) 2	(x) 161	(x) 483	77	2,041
Tunis . . . . .	0	0	108	86	0	0	300	234	9	930
<b>Totals . . . . .</b>	<b>85,059</b>	<b>103,718</b>	<b>100,674</b>	<b>93,619</b>	<b>297,915</b>	<b>311,537</b>	<b>323,396</b>	<b>299,996</b>	<b>1,323,594</b>	<b>1,281,100</b>
<b>Cheese. — (Thousand lbs.).</b>										
<i>Exporting Countries:</i>										
Denmark . . . . .	800	791	9	64	2,694	2,189	51	181	9,423	604
Finland . . . . .	496	511	2	0	1,693	1,601	4	9	5,776	33
Italy . . . . .	5,758	8,390	582	842	16,211	10,751	1,664	2,070	89,142	10,115
Lithuania . . . . .	108	179	0	2	489	511	0	2	2,540	11
Norway . . . . .	201	133	24	79	871	487	73	165	2,840	562
Netherlands . . . . .	10,939	13,995	104	126	35,940	41,742	232	324	190,400	1,345
Poland . . . . .	26	216	40	68	373	730	119	181	2,884	761
Switzerland . . . . .	3,243	5,082	406	507	9,603	14,096	1,378	1,440	54,307	8,470
Czechoslovakia . . . . .	534	553	165	240	2,401	2,251	518	602	10,981	3,779
Yugoslavia . . . . .	97	313	15	22	505	542	49	62	4,198	243
Canada . . . . .	930	489	101	150	2,350	1,715	256	324	84,790	1,446
Australia . . . . .	218	46	0	0	2,427	1,554	2	9	7,405	24
New Zealand . . . . .	18,735	31,061	0	0	60,332	75,409	0	2	181,708	4
<i>Importing Countries:</i>										
Germany . . . . .	487	536	6,795	8,591	1,149	1,823	22,055	26,676	7,372	120,404
Austria . . . . .	115	278	452	509	190	1,074	1,056	1,215	6,213	5,792
Belgium . . . . .	57	80	2,992	3,754	157	179	9,909	11,394	814	49,600
Spain . . . . .	26	22	295	282	46	51	595	851	236	8,387
Irish Free State . . . . .	...	...	...	...	(x) 22	(x) 26	(x) 331	(x) 421	194	2,687
France . . . . .	2,751	3,206	4,344	7,163	8,231	9,606	12,394	18,562	33,259	82,310
Gr. Brit. and N. Irel. . . . .	567	562	34,002	30,748	1,825	1,350	87,436	85,315	7,346	323,091
Greece . . . . .	4	9	121	29	7	29	763	683	190	8,960
Hungary . . . . .	7	20	0	26	15	40	9	86	110	203
Portugal . . . . .	...	...	44	51	...	...	88	99	...	842
Sweden . . . . .	...	...	88	148	...	...	229	362	...	1,691
United States . . . . .	143	223	4,769	4,610	414	542	12,079	12,796	1,865	61,992
India . . . . .	0	0	53	68	0	0	194	280	7	896
Java and Madura . . . . .	...	...	...	...	...	...	(x) 172	(x) 203	...	1,655
Syria and Lebanon . . . . .	...	...	...	...	(x) 2	(x) 0	(x) 179	(x) 121	86	708
Algeria . . . . .	...	...	...	...	...	...	...	...	196	11,132
Egypt . . . . .	...	...	...	...	(x) 88	(x) 22	(x) 586	(x) 1,444	78	7,336
Tunis . . . . .	0	0	170	183	0	2	527	509	24	2,038
<b>Totals . . . . .</b>	<b>46,242</b>	<b>56,704</b>	<b>56,073</b>	<b>58,496</b>	<b>148,965</b>	<b>177,632</b>	<b>153,958</b>	<b>163,436</b>	<b>704,440</b>	<b>708,138</b>

(x) (4) See notes page 353.

COUNTRIES	MARCH				EIGHT MONTHS (August 1-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31

<b>Cotton. — Thousand centals (1 cental = 100 lbs.).</b>										
<i>Exporting Countries:</i>										
United States . . . .	4,991	3,243	51	51	36,749	29,674	291	258	36,391	538
Argentina . . . . .	7	4	—	—	271	220	—	—	505	—
Brazil . . . . .	—	—	—	—	(1) 176	(1) 377	—	—	516	—
India . . . . .	672	1,755	256	172	5,278	10,626	838	937	14,881	1,876
Egypt . . . . .	—	—	—	—	(1) 4,987	(1) 4,015	(1) 0	(1) 0	6,689	0
<i>Importing Countries:</i>										
Germany . . . . .	108	137	855	581	1,160	1,162	5,776	6,001	1,706	8,442
Austria . . . . .	0	0	53	40	0	0	399	326	0	467
Belgium . . . . .	26	22	90	196	249	115	1,023	1,138	201	1,713
Denmark . . . . .	—	—	15	15	—	—	93	97	—	150
Spain . . . . .	7	0	392	256	20	15	1,567	1,543	24	2,253
Estonia . . . . .	0	0	4	—	0	—	44	62	0	84
Finland . . . . .	0	0	11	15	0	0	104	123	0	172
France . . . . .	26	42	355	562	373	368	2,383	6,188	549	8,131
Gr. Brit. and N. Irel.	29	37	1,455	1,023	269	320	8,843	8,278	481	10,959
Greece . . . . .	0	0	11	18	0	0	134	137	—	225
Hungary . . . . .	0	0	79	22	0	0	230	192	—	291
Italy . . . . .	0	0	454	370	0	2	2,765	2,612	2	3,821
Latvia . . . . .	—	—	—	—	(1) 0	(1) 0	(1) 35	(1) 44	0	62
Norway . . . . .	0	0	2	4	0	0	29	40	0	46
Netherlands . . . .	0	0	73	84	7	4	657	694	7	1,043
Poland . . . . .	2	2	64	101	18	15	697	979	24	1,444
Portugal . . . . .	—	—	31	29	—	—	254	236	—	333
Sweden . . . . .	—	—	40	20	—	—	388	304	—	467
Switzerland . . . .	0	0	51	35	4	0	308	445	7	608
Czechoslovakia . . .	11	13	179	214	97	106	1,411	1,673	154	2,368
Yugoslavia . . . . .	0	0	18	22	0	0	146	128	0	185
Canada . . . . .	—	—	106	108	—	—	701	776	—	1,025
Japan . . . . .	—	—	—	—	(1) 470	(1) 300	(1) 7,824	(1) 6,797	534	13,741
Algeria . . . . .	—	—	—	—	(2) 0	(2) 2	(2) 2	(2) 0	24	4
<b>Totals . . . . .</b>	<b>5,879</b>	<b>5,255</b>	<b>4,645</b>	<b>3,892</b>	<b>50,128</b>	<b>47,321</b>	<b>37,052</b>	<b>40,013</b>	<b>62,675</b>	<b>60,448</b>

<b>Wool. — (Thousand lbs.).</b>										
<b>SEVEN MONTHS (September 1-March 31)</b>										
<i>Exporting Countries:</i>										
Irish Free State . . .	—	—	—	—	(1) 6,080	(1) 3,003	(1) 445	(1) 293	7,065	752
Hungary . . . . .	11	212	66	101	1,179	1,545	829	1,133	6,031	1,612
Argentina . . . . .	45,250	41,998	—	—	198,020	183,650	—	—	290,449	—
Chile . . . . .	—	337	—	—	—	2,030	—	—	4,286	—
India . . . . .	0	5,907	—	—	15,313	17,622	—	—	28,455	—
China . . . . .	4,165	1,770	545	157	25,163	17,454	2,004	875	41,806	4,857
Syria and Lebanon . .	—	—	—	—	(1) 2,269	(1) 4,266	(1) 421	(1) 1,045	9,815	3,944
Algeria . . . . .	—	—	—	—	(4) 1,942	(4) 8,054	(4) 403	(4) 273	16,636	1,371
Egypt . . . . .	—	—	—	—	(1) 833	(1) 1,093	(1) 0	(1) 0	3,752	2
Un. of S. Africa . . .	—	—	—	—	(2) 82,480	(2) 120,192	(2) 0	(2) 33	269,750	33
Australia . . . . .	30,136	84,563	551	456	(2) 1,479	(2) 1,204	(2) 545	(2) 430	4,630	500
New Zealand . . . .	4,916	4,447	0	0	597,265	585,133	1,713	1,030	749,742	2,337
—	36,301	31,899	0	0	35,303	25,580	7	37	43,923	53
—	4,145	7,421	0	0	120,862	96,278	2	0	172,832	0
—	—	—	—	—	28,040	20,437	4	0	44,675	0
<i>Importing Countries:</i>										
Germany . . . . .	165	1,792	21,557	21,688	8,744	6,008	119,998	171,070	11,305	329,621
Austria . . . . .	611	1,168	2,641	2,540	6,711	7,081	18,543	16,519	13,153	30,552
Belgium . . . . .	4	20	957	1,759	55	179	5,300	8,298	254	14,264
Denmark . . . . .	—	—	—	—	(3) 5,020	(3) 5,670	(3) 39,734	(3) 44,966	10,311	138,435
Spain . . . . .	9	18	346	432	(3) 9,866	(3) 8,525	(3) 1,444	(3) 1,671	21,638	3,918
Finland . . . . .	472	73	1,962	1,285	115	46	2,694	2,284	93	3,591
France . . . . .	2	0	260	82	1,907	2,650	3,713	4,292	3,946	10,474
Gr. Britain and N. Ir.	2,665	6,023	34,846	24,915	82	20	1,421	1,431	84	2,328
Greece . . . . .	30,589	16,585	121,991	99,706	20,024	31,237	196,966	261,282	51,506	480,966
Italy . . . . .	0	24	163	291	162,472	150,757	518,355	455,466	309,523	821,498
Norway . . . . .	82	251	14,839	8,210	71	181	1,530	1,607	392	3,025
Netherlands . . . .	44	838	1,107	551	935	1,104	76,988	59,384	2,161	96,686
Poland . . . . .	55	66	205	172	1,109	1,372	9,647	5,410	4,967	9,599
Sweden . . . . .	84	247	840	1,422	478	384	1,420	1,041	725	1,596
Switzerland . . . .	31	24	767	714	1,230	1,199	4,434	6,382	2,394	8,770
Czechoslovakia . . .	104	355	1,938	1,563	346	174	4,587	4,129	388	7,134
Yugoslavia . . . . .	—	—	2,033	926	1,272	1,565	14,357	17,198	2,610	38,253
Canada . . . . .	22	63	2,072	1,336	—	—	10,860	7,463	—	15,461
Japan . . . . .	71	104	2,734	1,638	353	179	10,789	11,063	366	18,922
United States . . . .	0	2	337	1,534	1,457	780	19,449	16,874	1,590	86,952
Tunis . . . . .	168	207	1,830	2,059	84	24	1,975	5,553	24	7,963
—	64	110	6,422	15,349	3,944	1,098	4,535	6,896	2,271	12,017
—	—	—	—	—	622	780	71,520	78,267	2,224	153,226
—	—	—	—	—	(1) 35	(1) 88,476	(1) 80,312	(1) 13	142,252	13
—	2	11	22	40	(2) 68	(2) 104	(2) 256	(2) 470	461	800
<b>Totals . . . . .</b>	<b>210,177</b>	<b>206,530</b>	<b>221,081</b>	<b>189,079</b>	<b>1,347,548</b>	<b>1,309,136</b>	<b>1,236,435</b>	<b>1,255,784</b>	<b>2,137,776</b>	<b>2,403,714</b>

a) = Wool, greasy; b) = Wool, scoured.  
(1) (2) (3) (4) See notes page 353.

COUNTRIES	MARCH		NINE MONTHS (July 1-March 31)		TWELVE MONTHS (July 1-June 30)	COUNTRIES	MARCH		NINE MONTHS (July 1-March 31)		TWELVE MONTHS (July 1-June 30)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Coffee. (Thousand lbs.).</b>						<b>Tea. (Thousand lbs.).</b>					
<b>EXPORTS.</b>						<b>EXPORTS.</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Brazil . . . . .	...	...	1,413,917	1,552,915	2,385,736	Ceylon . . . . .	18,938	21,713	163,806	171,787	247,597
India . . . . .	2,987	6,729	10,767	16,705	23,490	India . . . . .	5,016	8,600	309,173	318,662	347,401
Java and Madura .	3,111	2,277	37,615	33,680	38,105	Java and Madura .	13,658	15,443	120,831	116,570	158,636
<i>Importing Countries:</i>						Japan . . . . .	...	...	(x) 20,126	(x) 17,820	24,315
Germany . . . . .	20	117	1,365	1,010	1,345	<i>Importing Countries:</i>					
Belgium . . . . .	767	617	9,057	2,771	5,080	Belgium . . . . .	0	2	20	24	31
France . . . . .	0	0	13	57	60	Irish Free State .	...	...	(x) 181	(x) 110	185
Netherlands . . . .	1,380	1,744	11,345	14,870	19,059	France . . . . .	2	4	53	29	35
Portugal . . . . .	183	37	873	425	553	Gr. Brit. and N. Ir.	5,663	7,979	65,200	65,427	87,052
Switzerland . . . . .	40	13	520	231	399	Netherlands . . . .	11	11	108	82	115
Canada . . . . .	2	4	31	44	55	United States . . . .	62	40	403	379	476
United States . . . .	6,956	1,477	17,710	17,187	24,238	Syria and Lebanon .	...	...	(x) 4	(x) 11	18
Ceylon . . . . .	0	0	11	225	227	Algeria . . . . .	...	...	(2) 26	(2) 11	22
Syria and Lebanon .	...	...	(x) 7	(x) 42	62	Union of S. Africa .	...	...	(2) 22	(2) 35	66
Australia . . . . .	2	2	40	42	53	Australia . . . . .	42	40	445	692	851
<b>Totals . . . . .</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,496,527</b>	New Zealand . . . .	...	...	(x) 53	(x) 79	115
<b>Totals . . . . .</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,496,527</b>	<b>Totals . . . . .</b>	<b>43,363</b>	<b>53,832</b>	<b>680,451</b>	<b>691,718</b>	<b>867,015</b>
<b>IMPORTS.</b>						<b>IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	17,891	25,179	237,500	263,319	350,362	Germany . . . . .	895	794	8,214	9,852	12,741
Austria . . . . .	1,397	1,517	12,222	15,428	23,263	Austria . . . . .	66	88	871	1,014	1,409
Belgium . . . . .	7,233	13,153	101,640	87,938	123,457	Belgium . . . . .	97	60	540	481	639
Bulgaria . . . . .	203	165	1,188	1,237	1,660	Denmark . . . . .	104	137	994	983	1,296
Denmark . . . . .	6,316	6,675	51,703	46,050	63,220	Spain . . . . .	42	18	245	212	282
Spain . . . . .	8,651	4,257	41,985	54,726	68,795	Estonia . . . . .	7	11	121	112	146
Estonia . . . . .	20	15	207	231	309	Irish Free State .	...	...	(x) 17,313	(x) 16,757	24,346
Irish Free State . .	...	...	(x) 265	(x) 282	525	Finland . . . . .	13	22	207	194	200
Finland . . . . .	1,951	2,046	24,482	31,930	40,442	France . . . . .	300	340	2,553	2,637	3,536
France . . . . .	39,672	33,323	315,447	297,627	406,168	Gr. Britain and N.					
Gr. Britain and N.						Ireland . . . . .	32,648	34,046	453,770	459,088	541,616
Ireland . . . . .	3,816	3,408	28,323	27,860	37,858	Greece . . . . .	55	44	531	547	644
Greece . . . . .	780	1,054	10,206	9,661	12,959	Hungary . . . . .	33	42	494	549	650
Hungary . . . . .	432	547	4,583	5,196	7,568	Italy . . . . .	31	29	249	240	326
Italy . . . . .	8,095	8,796	70,235	73,447	98,430	Latvia . . . . .	...	...	(x) 104	(x) 119	168
Latvia . . . . .	...	...	(x) 313	(x) 251	351	Lithuania . . . . .	4	18	88	143	179
Lithuania . . . . .	4	44	410	381	478	Norway . . . . .	22	31	302	284	388
Norway . . . . .	2,275	3,699	27,408	27,340	37,690	Netherlands . . . .	2,522	3,009	22,781	23,220	31,354
Netherlands . . . .	7,427	8,292	81,018	76,844	100,433	Poland . . . . .	218	474	3,452	3,569	4,614
Poland . . . . .	485	1,570	14,152	12,994	17,589	Portugal . . . . .	77	64	505	456	597
Portugal . . . . .	822	988	8,636	8,486	11,413	Sweden . . . . .	73	93	692	699	923
Sweden . . . . .	3,973	3,541	37,548	73,652	100,829	Switzerland . . . .	148	143	1,334	1,261	1,731
Switzerland . . . . .	2,912	3,042	24,853	21,541	31,608	Czechoslovakia . .	99	110	1,468	1,235	1,473
Czechoslovakia . .	3,069	2,831	24,412	21,239	29,026	Yugoslavia . . . . .	29	44	525	553	628
Yugoslavia . . . . .	1,237	2,579	13,162	16,440	20,862	United States . . .	9,125	6,614	35,680	36,061	43,147
Canada . . . . .	4,330	4,561	23,797	24,260	33,889	Chile . . . . .	7,465	7,994	72,343	69,878	87,151
United States . . . .	161,059	185,720	1,242,543	1,256,240	1,728,578	Syria and Lebanon .	571	295	4,264	3,843	5,362
Chile . . . . .	816	981	7,218	8,951	10,516	Turkey . . . . .	157	159	1,107	1,634	2,138
Ceylon . . . . .	170	123	3,441	2,663	3,148	Algeria . . . . .	...	...	(2) 1,349	(2) 1,545	3,150
Japan . . . . .	...	...	(x) 3,572	(x) 2,826	4,478	Egypt . . . . .	...	...	(x) 9,908	(x) 7,639	13,616
Syria and Lebanon .	...	...	(x) 1,541	(x) 1,847	2,732	Tunis . . . . .	198	44	5,957	2,086	2,952
Turkey . . . . .	441	1,043	6,823	9,564	12,853	Union of S. Africa .	...	...	(x) 7,897	(x) 6,557	13,293
Algeria . . . . .	...	...	(2) 14,511	(2) 14,890	30,827	Australia . . . . .	4,068	3,424	33,960	37,741	46,441
Egypt . . . . .	...	...	(x) 10,617	(x) 8,245	14,857	New Zealand . . . .	...	...	(x) 7,374	(x) 7,043	14,405
Tunis . . . . .	348	55	2,350	2,280	3,036	<i>Exporting Countries:</i>					
Un. of S. Africa . .	...	...	(2) 15,704	(2) 15,840	31,890	India . . . . .	249	569	5,545	4,914	6,232
Australia . . . . .	176	159	2,083	1,911	2,619	Java and Madura .	...	...	(x) 7,513	(x) 8,869	11,530
New Zealand . . . .	...	...	(x) 265	(x) 273	480	<b>Totals . . . . .</b>	<b>59,316</b>	<b>53,716</b>	<b>716,157</b>	<b>712,319</b>	<b>890,624</b>
<b>Totals . . . . .</b>	<b>286,161</b>	<b>324,709</b>	<b>2,516,013</b>	<b>2,535,268</b>	<b>3,469,093</b>						

(1) (2) See notes page 353.

COUNTRIES	MARCH		SIX MONTHS (Oct. 1-March 31)		TWELVE MONTHS (Oct. 1- Sept. 30)	COUNTRIES	MARCH		EIGHT MONTHS (Aug. 1-March 31)		TWELVE MONTHS August 1- (July 31)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Cacao (Thousand lbs.).</b>						<b>Total Wheat and Flour (*)</b> (Thousand centals).					
<b>EXPORTS.</b>						<b>a) NET EXPORTS</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada . . . . .	882	1,435	4,041	5,053	9,905	Bulgaria . . . . .	774	306	5,382	1,246	3,527
Dominican Republ.	2,205	1,303	11,502	12,282	61,328	Spain . . . . .	2	0	(5)	64	104
Brazil . . . . .	...	...	(x) 95,604	(x) 71,210	146,469	Hungary . . . . .	331	844	8,066	8,803	10,591
Ecuador . . . . .	4,409	2,701	13,803	13,036	33,076	Lithuania . . . . .	9	112	44	489	567
Trinidad . . . . .	7,020	7,139	21,352	29,765	61,569	Poland . . . . .	302	223	935	1,936	2,586
Venezuela . . . . .	2,205	6,006	9,819	19,828	45,076	Rumania . . . . .	...	...	(x) 20,638	(x) 6,912	9,557
Ceylon . . . . .	1,605	873	7,031	5,485	3,860	U. S. S. R. . . . .	...	...	a) 37,426	a) 750,067	(x) 67,735
Java and Madura .	46	68	1,173	1,102	3,073	Yugoslavia . . . . .	417	7	7,333	2,864	3,362
Cameroon . . . . .	3,527	2,017	21,603	21,096	30,126	Canada . . . . .	7,024	9,244	84,005	109,731	154,489
Ivory Coast . . . . .	8,598	6,621	37,413	33,638	43,363	United States . . . . .	4,577	1,962	47,122	41,076	65,495
Gold Coast . . . . .	43,784	93,315	364,454	334,352	486,374	Argentina . . . . .	17,531	8,038	55,250	36,692	74,466
Nigeria . . . . .	13,589	14,989	87,954	96,832	116,385	Chile . . . . .	4	9	24	549	567
St. Thomas and Prince Is. . . . .	2,048	2,721	14,524	16,136	26,764	British India . . . . .	126	(5)	818	(5)	(5)
Togoland . . . . .	2,701	3,602	11,629	12,423	16,400	Syria and Lebanon . . . . .	...	...	(x) 269	(5)	(5)
						Turkey . . . . .	161	13	644	201	282
<i>Importing Countries:</i>						Algeria . . . . .	...	...	(z) 688	(z) 4,706	4,614
Germany . . . . .	0	0	459	432	454	Tunis . . . . .	203	42	1,603	1,246	3,481
Belgium . . . . .	170	150	529	379	309	Australia . . . . .	11,524	10,569	60,704	51,275	90,379
France . . . . .	0	0	2	223	223	<b>Totals . . . . .</b>	<b>42,985</b>	<b>31,369</b>	<b>331,851</b>	<b>318,517</b>	<b>491,802</b>
Netherlands . . . . .	282	1,001	4,004	6,616	10,679						
Czechoslovakia . . . . .	0	0	0	13	18						
United States . . . . .	675	685	4,182	4,292	8,521						
Australia . . . . .	0	0	119	37	86						
<b>Totals . . . . .</b>	<b>93,746</b>	<b>145,565</b>	<b>711,287</b>	<b>684,232</b>	<b>1,109,058</b>						
<b>IMPORTS.</b>						<b>b) NET IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	13,838	12,692	107,191	99,299	180,001	Germany . . . . .	858	745	4,059	11,116	18,689
Austria . . . . .	1,325	1,091	6,920	6,135	10,662	Austria . . . . .	686	677	5,642	5,067	9,345
Belgium . . . . .	2,165	3,508	12,031	13,122	25,582	Belgium . . . . .	1,605	2,319	17,099	18,409	29,125
Bulgaria . . . . .	101	86	679	384	774	Denmark . . . . .	637	373	7,970	4,096	6,905
Denmark . . . . .	690	814	3,920	4,407	7,643	Spain . . . . .	(6)	(5)	15	(6)	(6)
Spain . . . . .	4,473	1,625	12,324	12,954	22,472	Estonia . . . . .	20	11	190	370	485
Estonia . . . . .	26	44	375	231	478	Irish Free State . . . . .	...	...	(x) 6,003	(x) 6,737	11,279
Irish Free State . . . . .	...	...	(x) 472	(x) 336	1,796	Finland . . . . .	141	154	1,317	2,125	2,956
Finland . . . . .	11	11	108	115	220	France . . . . .	3,613	2,696	23,841	17,804	36,595
France . . . . .	8,001	6,709	46,266	44,478	90,116	Gr. Brit. and N. Ir. . . . .	11,680	11,244	100,685	90,950	134,311
Gr. Brit. and N. Ir. . . . .	16,601	23,435	77,696	79,243	141,747	Greece . . . . .	1,365	1,184	9,564	8,336	14,454
Greece . . . . .	243	207	1,984	1,321	2,480	Italy . . . . .	2,401	4,345	6,768	30,933	48,322
Hungary . . . . .	269	556	3,139	2,513	5,432	Latvia . . . . .	...	...	(x) 311	(x) 657	924
Italy . . . . .	1,601	1,539	8,201	8,891	16,619	Norway . . . . .	370	300	3,840	3,369	4,985
Latvia . . . . .	...	...	(x) 836	(x) 800	1,724	Netherlands . . . . .	1,443	1,001	11,759	14,339	20,858
Lithuania . . . . .	37	53	298	397	703	Portugal . . . . .	33	42	639	348	1,607
Norway . . . . .	448	622	3,287	2,386	4,705	Sweden . . . . .	386	130	2,597	2,269	2,389
Netherlands . . . . .	8,342	17,555	57,071	83,529	147,201	Switzerland . . . . .	(x) 860	(x) 873	(x) 8,546	(x) 7,957	(x) 11,094
Poland . . . . .	966	1,054	6,036	6,799	12,313	Czechoslovakia . . . . .	1,091	119	10,155	7,851	10,302
Sweden . . . . .	672	998	6,263	4,438	9,062	Ceylon . . . . .	26	33	408	410	597
Switzerland . . . . .	2,191	4,359	6,550	12,707	23,803	India . . . . .	(6)	825	(6)	1,590	3,062
Czechoslovakia . . . . .	1,828	1,415	8,812	8,470	18,237	Indochina . . . . .	60	37	877	417	571
Yugoslavia . . . . .	152	143	664	776	1,473	Japan . . . . .	...	...	(x) 6,230	(x) 4,486	10,394
Canada . . . . .	1,317	2,156	8,477	8,898	15,371	Java and Madura . . . . .	...	...	(x) 911	(x) 730	1,367
United States . . . . .	83,428	46,910	259,741	175,352	406,686	Syria and Lebanon . . . . .	...	...	(5)	(x) 64	101
Australia . . . . .	581	963	6,142	3,131	7,306	Egypt . . . . .	...	...	(x) 2,685	(x) 3,362	5,766
New Zealand . . . . .	...	...	(x) 829	(x) 644	1,504	Union of South Afr. . . . .	...	...	(z) 529	(z) 842	1,983
<b>Totals . . . . .</b>	<b>150,351</b>	<b>128,543</b>	<b>646,312</b>	<b>583,009</b>	<b>1,156,092</b>	<b>Totals . . . . .</b>	<b>27,289</b>	<b>27,108</b>	<b>235,566</b>	<b>245,358</b>	<b>399,925</b>

(\*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

(x) Excess of exports over imports. — (y) Excess of imports over exports.

(1) Data up to the end of February. — (2) Data up to 31st December. — (3) Data up to 31st January. — (4) Data up to 30th November. — (5) See Net Imports. — (6) See Net Exports. — (7) Wheat only.

## STOCKS

STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS  
IN GERMANY.

PRODUCTS	% Stocks: total production				% Available saleable quantities: total production			
	April 15, 1932	March 15, 1932	April 15, 1931	April 15, 1930	April 15, 1932	March 15, 1932	April 15, 1931	April 15, 1930
Winter wheat . . . . .	10.4	15.5	8.7	14.2	7.1	11.3	5.3	9.5
Spring wheat . . . . .	19.8	36.6	13.9	15.6	14.7	26.3	10.0	10.9
Winter rye . . . . .	12.2	18.6	18.2	24.6	3.4	6.1	7.2	12.7
Winter barley . . . . .	6.9	10.8	7.4	13.8	0.8	1.3	0.7	1.9
Spring barley . . . . .	12.8	21.5	8.0	11.6	4.0	8.1	1.3	4.3
Oats . . . . .	28.8	41.0	32.0	34.4	3.9	7.8	5.2	10.0
Potatoes . . . . .	21.9	33.3	21.9	24.8	3.9	9.9	3.2	5.2

Authority: Preisberichtstelle beim Deutschen Landwirtschaftsrat.

## STOCKS OF CEREALS IN COMMERCIAL ELEVATORS AND MILLS IN GERMANY (1).

PRODUCTS	Last day of month			Last day of month		
	April 1932	March 1932	February 1932	April 1932	March 1932	February 1932
	1,000 centals			1,000 bushels or barrels		
WHEAT:						
Grain . . . . .	9,537	11,188	11,091	15,895	18,647	19,985
Flour for bread . . . . .	2,743	2,868	3,274	1,899	1,463	1,670
TOTAL (2) . . . . .	13,194	15,013	16,356	21,991	25,022	27,260
RYE:						
Grain . . . . .	8,155	8,221	8,042	14,562	14,681	14,362
Flour for bread . . . . .	1,288	1,228	1,340	657	627	684
TOTAL (2) . . . . .	9,872	9,859	9,830	17,626	17,606	17,555
BARLEY . . . . .	2,008	2,320	3,957	4,184	5,875	8,245
OATS . . . . .	1,673	2,202	2,912	5,229	6,833	9,101

(1) See note under the corresponding table in the Bulletin for March, at page 218. — (2) Including flour in terms of grain, on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain (1,000 barrels of flour = 4,355.55 bushels of wheat or 4,384.80 bushels of rye).

STOCKS OF POTATOES IN FARMERS' HANDS IN THE NETHERLANDS  
(partial data) (1).

DATE OF ESTIMATE	% Stocks: production		Production in absolute figures				Production of communes as percentage of total production for the country (2).
	Clay soils	Sand and fen soils	Clay soils	Sand and fen soils	Clay soils	Sand and fen soils	
			1,000 centals		1,000 bushels		
15 January 1930 . . . . .	42	16	9,573	4,903	15,954	8,172	58
15 April 1930 . . . . .	16	6	3,024	1,336	6,041	3,061	
15 January 1931 . . . . .	27	16	4,561	4,226	7,602	7,044	65
15 April 1931 . . . . .	8	5	1,314	1,243	2,190	2,072	
15 January 1932 . . . . .	28	19	4,978	4,206	3,297	7,011	67
15 April 1932 . . . . .	13	8	2,272	1,794	3,786	2,989	

(1) Estimate for the communes in which production is considered to exceed consumption. — (2) Production of the year preceding that indicated.

## WHEAT AND WHEAT-FLOUR STOCKS HELD BY COMMERCIAL MILLS IN THE UNITED STATES (1).

Specification and situation	Last day of month					Last day of month				
	March 1932	Dec. 1931	Sept. 1931	March 1931	March 1930	March 1932	Dec. 1931	Sept. 1931	March 1931	March 1930
	1,000 centals					1,000 bushels or barrels				
Wheat held by mills and mill elevators attached to mills. . . . .	44,122	54,571	57,951	33,862	41,507	73,537	90,952	96,586	56,436	69,170
Wheat in transit to merchant mills and bought to arrive. . . . .	5,173	6,485	8,995	4,008	4,837	8,621	10,808	14,991	8,180	8,062
Wheat-flour in mills and warehouses, and in transit, sold and unsold. . . . .	7,679	8,087	6,922	7,276	8,308	3,918	4,126	3,532	3,712	4,239
TOTAL (2) . . .	60,344	72,691	76,906	49,238	58,299	100,573	121,152	122,176	82,063	97,163

(1) Partial census, including mills accounting for over 90 % of the total capacity of all commercial mills; see article about cereal stocks on page 502 of Crop Report for August 1931. — (2) Including flour in terms of wheat.

## STOCKS OF WHEAT IN INTERIOR MILLS AND ELEVATORS IN THE UNITED STATES ON APRIL 1st.

Stocks of wheat in country elevators and the smaller interior mills were reported as follows (figures in thousands): 1st April 1932: 42,055 centals (70,091 bushels); 1st March 1932: 44,765 centals (74,609 bushels); 1st April 1931: 42,974 centals (71,623 bushels); 1st March 1931: 49,923 centals (83,205 bushels); 1st March 1930: 60,689 centals (101,149 bushels).

## COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	May 1932	April 1932	March 1932	May 1931	May 1930	May 1932	April 1932	March 1932	May 1931	May 1930
	1,000 centals					1,000 bushels				
<b>WHEAT:</b>										
Canadian in Canada. . . . .	95,089	103,734	108,195	91,853	94,747	159,982	172,890	171,991	153,088	157,912
U. S. in Canada. . . . .	16,123	15,347	16,809	3,538	3,259	26,872	25,578	27,682	5,897	5,431
U. S. in the United States. . . . .	111,943	124,323	129,770	123,804	81,232	186,572	207,213	216,284	206,490	185,470
Canad. in the United States. . . . .	2,780	6,855	8,741	1,660	10,552	4,634	11,425	14,569	2,766	17,587
Total . . .	226,835	250,264	268,315	220,915	189,340	378,060	417,106	430,526	368,241	316,400
<b>RYE:</b>										
Canadian in Canada. . . . .	5,793	6,103	6,145	7,423	4,542	10,345	10,899	10,973	13,255	8,111
U. S. in Canada. . . . .	119	140	378	1,181	1,505	213	250	675	2,109	2,683
U. S. in the United States. . . . .	5,316	5,641	5,903	6,154	7,973	9,403	10,073	10,005	10,990	18,701
Canad. in the United States. . . . .	445	913	778	153	239	796	1,631	1,389	273	426
Total . . .	11,673	12,797	12,904	14,911	13,959	20,846	22,853	23,042	26,627	24,926
<b>BARLEY:</b>										
Canadian in Canada. . . . .	3,316	4,623	4,741	11,065	10,324	7,949	9,842	9,373	23,053	21,507
U. S. in Canada. . . . .	12	12	12	117	476	25	25	25	243	993
U. S. in the United States. . . . .	2,271	2,006	2,438	3,513	3,006	4,731	4,179	5,184	7,319	8,137
Canad. in the United States. . . . .	610	710	745	367	1,303	1,271	1,479	1,552	764	2,715
Total . . .	6,709	7,356	7,936	15,062	16,009	13,976	15,325	16,039	31,379	33,352
<b>OATS: (1)</b>										
Canadian in Canada. . . . .	3,758	5,093	4,968	4,037	4,268	11,745	15,917	15,519	12,615	13,387
U. S. in Canada. . . . .	25	0	1	270	658	78	0	2	872	2,055
U. S. in the United States. . . . .	4,998	5,055	5,739	4,458	5,286	13,745	15,796	17,935	18,980	16,519
Canad. in the United States. . . . .	0	0	1	25	105	1	1	2	78	330
Total . . .	8,181	10,148	10,707	8,799	10,317	25,569	31,714	33,458	27,495	32,241
<b>MAIZE:</b>										
U. S. in Canada. . . . .	539	0	438	267	35	1,051	0	871	476	62
of other origin in Canada. . . . .	676	808	1,000	439	553	1,207	1,443	1,736	764	933
U. S. in the United States. . . . .	12,323	12,652	10,356	11,030	11,801	22,015	22,598	18,492	19,697	21,078
Total . . .	13,538	13,460	11,844	11,736	12,389	24,273	24,036	21,149	20,957	22,123

(1) All oats expressed in bushels of 32 lbs.

## QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

PRODUCTS	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	May 1932	April 1932	March 1932	May 1931	May 1930	May 1932	April 1932	March 1932	May 1931	May 1930
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat) . .	32,000	35,203	34,790	28,834	20,765	54,848	58,672	57,984	48,056	34,608
Rye . . . . .	2,208	3,571	1,253	1,315	24	3,043	6,377	2,237	2,349	43
Barley . . . . .	1,816	3,200	2,756	3,532	2,812	3,783	6,677	5,742	7,353	5,858
Oats . . . . .	3,069	2,336	2,995	1,824	1,328	9,500	7,300	9,360	5,700	4,150
Maize . . . . .	19,435	12,062	12,134	14,971	8,794	34,706	21,540	21,669	26,374	15,703

Authority: *Broomhall's Corn Trade News*

## GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	May 1932	April 1932	March 1932	May 1931	May 1930	May 1932	April 1932	March 1932	May 1931	May 1930
	1,000 centals					1,000 bushels				
WHEAT:										
Grain . . . . .	7,396	8,376	9,336	5,400	4,944	13,160	13,960	15,560	9,000	8,240
Flour as grain . .	768	840	960	552	1,008	1,280	1,400	1,600	920	1,680
TOTAL . . . . .	8,664	9,216	10,296	5,952	5,952	14,440	15,360	17,160	9,920	9,920
Barley . . . . .	800	900	880	840	1,200	1,667	1,875	1,833	1,750	2,500
Oats . . . . .	464	448	320	608	512	1,450	1,400	1,000	1,800	1,600
Maize . . . . .	2,640	4,560	5,904	1,560	1,200	4,714	8,143	10,543	2,786	2,000

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.

## STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	April 1932	March 1932	Feb. 1932	April 1931	April 1930	April 1932	March 1932	Feb. 1932	April 1931	April 1930
	1,000 centals					1,000 bales (counting round as half bales)				
In consuming establishments . . . .	7,535	7,696	8,028	6,634	8,093	1,533	1,566	1,633	1,371	1,662
In public storage and at compresses . .	40,164	43,131	49,004	29,222	17,726	8,164	8,767	9,961	6,033	3,687
TOTAL . . . . .	47,699	50,827	57,032	35,856	25,819	9,697	10,333	11,594	7,404	5,349

## STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	May 1932	April 1932	March 1932	May 1931	May 1930	May 1932	April 1932	March 1932	May 1931	May 1930
	1,000 centals					1,000 bales (1 bale = 478 lbs.)				
Bombay (1) . . . .	8,024	2,524	2,180	4,024	5,228	683	528	456	842	1,094
Alexandria . . . .	4,676	4,842	5,065	4,965	3,847	978	1,013	1,060	1,087	805

Authorities: *East Indian Cotton Ass.* and *Commission de la Bourse de Mines-et-Bassat*.

(1) Stocks held by exporters, dealers and mills.



STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTORS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	May 1932	April 1932	March 1932	May 1931	May 1930	May 1932	April 1932	March 1932	May 1931	May 1930
	1,000 centals					1,000 bales (1 bale = 478 lbs.)				
<i>Great Britain:</i>										
American . . . .	2,022	2,120	1,989	2,508	2,015	423	445	416	525	422
Argentine, Brazil- ian, etc. . . . .	40	68	83	208	594	8	13	17	44	124
Peruvian, etc. . .	142	173	194	236	260	30	36	41	49	54
East Indian, etc.	481	505	552	844	319	101	105	115	176	67
Egyptian, Sudan- ese . . . . .	1,714	1,625	1,470	1,896	982	358	340	308	292	205
Other (1) . . . .	104	120	126	237	389	22	25	26	50	61
TOTAL . . . . .	4,503	4,615	4,414	5,429	4,459	942	965	923	1,136	933
<i>Bremen:</i>										
American . . . .	1,460	1,527	1,486	4,427	2,147	305	319	311	508	449
Other . . . . .	23	33	22	48	47	5	7	5	10	10
TOTAL . . . . .	1,483	1,560	1,508	2,475	2,194	310	326	316	518	459
<i>Le Havre:</i>										
American . . . .	857	812	805	1,166	1,198	179	170	168	348	251
Other . . . . .	57	55	55	160	157	12	11	12	34	23
TOTAL . . . . .	914	867	860	1,326	1,355	191	181	180	382	264
<i>Total Continent (2):</i>										
American . . . .	3,173	3,238	3,141	4,691	3,835	664	677	657	981	802
Argentine, Brazil- ian, etc. . . . .	27	26	32	100	67	5	5	7	21	14
E. Indian, Austral- ian, etc. . . . .	85	91	90	244	228	18	19	19	51	47
Egyptian . . . .	138	154	124	109	98	29	32	26	23	20
W. Indian, W. Afri- can, E. African, etc. . . . .	19	21	28	52	81	4	5	6	11	17
TOTAL . . . . .	3,442	3,530	3,415	5,196	4,305	720	738	715	1,087	900

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGES 160 TO 163 OF THE CROP REPORT FOR FEBRUARY

(SEE ALSO THE SAME HEADING IN THE PRECEDING CROP REPORTS FOR THIS YEAR).

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Germany . . . . .	Wheat for poultry feed, under special licence (1).	18 April	free	free
" . . . . .	Wheat for conversion into flour and groats, under Customs control (2).	1 May	R. M. 18.00	116.69
Czechoslovakia . . . . .	Rye, supplementary duty . . . . .	1 April	Cz. cr. 22.00	16.57
" . . . . .	Wheat and rye flour, supplementary duty . . . .	"	" 55.00	144.96

(1) Imports limited to certain quantities. — (2) To be imported by milling establishments which, between April and June, 1930, have utilised foreign wheat or spelt for conversion into flour and groats. Imports limited to the months of May and June, 1932 and to 15 % of the total quantity of home-grown and foreign wheat and spelt used for that purpose by such establishments during the second quarter of 1930.

NOTE: In the table on page 160 of the Crop Report for February should be added under Irish Free State in the column "Oats": duty of 1/8 per cwt. (4.10 \$ c per bushel) for imports consigned from and grown within the British Empire.

## MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTION	May	May	May	April,	April	Average (2)					Commercial Season	
	20,	13,	6,	29,	22,	April	May	May				
	1932	1932	1932	1932	1932					1932		
	1932	1932	1932	1932	1932	1932	1932	1931	1930	1930-31	1929-30	
WHEAT.												
Budapest (b): Tisza region (78-80 kg. p. hl.; pengő p. quintal) . . . . .	12.67	12.45	13.02	13.25	13.32	15.50	15.38	21.77	15.34	22.94		
Braila: Good quality (lei p. quintal) . . . . .	360	340	335	335	337	329	357	564	351	612		
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.) . . . . .	63 1/2	62 7/8	62 1/2	60 1/2	62 7/8	61 1/2	60 3/4	108 1/2	64 1/4	124 1/2		
Chicago: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	n. 52	n. 56	n. 56 1/2	n. 57	57	n. 56	83 3/4	103 3/4	78	114 1/2		
Minneapolis: No. 1 Northern (cents p. 60 lbs.) . . . . .	66 1/2	64 1/2	64 1/4	64 1/2	68	66 1/2	80 5/8	103 3/4	77 7/8	117 1/2		
New York: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	72	69	69	67 7/8	68 5/8	67 3/4	n. q.	110 1/2	n. 91 1/2	121 1/2		
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper p. quintal) . . . . .	7.20	7.15	7.05	6.95	7.15	6.97	6.02	10.44	6.83	10.65		
Karachi: Karachi white, 2 1/2 % barley, 1 1/2 % dirt (rupees p. 656 lbs.) . . . . .	21-6-0	21-4-0	20-10-0	21-14-0	21-10-0	21-11-9	18-8-0	32-13-0	19-15-2	36-6-9		
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	27.30	27.40	27.70	26.80	26.30	26.20	23.51	23.97	26.00	25.33		
Hamburg, c. i. f. (Reichsmarks p. quintal):												
No. 3 Manitoba . . . . .	3) 10.26	(3) 10.56	(3) 10.26	(3) 10.33	(3) 11.07	(3) 10.98	(3) 12.02	18.60	(3) 12.65	21.30		
No. 2 Hard Winter . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. 11.07	17.91	n. 13.00	19.49		
Barusso (79 kg. p. hectol.) . . . . .	4) 9.40	(4) 9.74	(4) 9.23	(4) 9.26	(4) 9.49	(4) 9.26	9.87	(5) 17.30	11.10	18.72		
Antwerp (Belgian francs p. quintal):												
Home grown . . . . .	86	85	85	86	85	81 1/2	101	151	95 1/2	154 1/2		
No. 2 Hard Winter, Gulf . . . . .	6) 85	6) 84	(6) 84	6) 88	6) 92	6) 88 1/2	99 1/2	156 1/2	112 1/2	171		
Paris: Home grown, 75-77 kg. (francs p. quintal) . . . . .	176.25	172.75	170.75	167.50	169.50	170.10	185.60	127.70	175.00	139.40		
London: Home grown (shillings p. 504 lbs.) . . . . .	27/-	26/-	26/-	26/-	26/-	26/4	25/6	38/9	27/1	40/10		
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):												
South Russian (on sample) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	23/7	n. q.		
No. 3 Manitoba . . . . .	26/10 1/2	26/10 1/2	26/7 1/2	26/7 1/2	23/3	27/5	23/9	39/8	25/4	45/2		
No. 2 Hard Winter . . . . .	26/9	26/6	26/4 1/2	26/3	27/3	26/7	7) 22/10	38/2	26/4	41/5		
White Pacific . . . . .	13) 30/-	n. q.	n. q.	n. q.	n. q.	n. q.	24/8	38/10	26/7	42/3		
Rosafe (63 1/2 lbs.), afloat . . . . .	8) 26/-	(8) 25/6	(8) 25/3	(8) 24/3	(8) 24/9	(8) 24/4	(9) 21/4	(10) 38/2	23/5	40/3		
Choice White Karachi . . . . .	23/6	27/9	28/-	n. q.	n. q.	n. q.	24/6	39/10	27/-	42/2		
Australian . . . . .	27/-	27/-	26/9	27/3	27/3	27/2	23/8	40/8	25/7	43/6		
Milan (b): Home grown, soft (lire p. quintal) . . . . .	121.50	122.50	121.50	120.00	119.50	118.80	112.20	137.10	109.10	131.80		
Genoa c. i. f. (shillings p. metric ton): La Plata . . . . .	11)n.2.27	11)n.2.30	11)n.2.30	(11) 2.27	(11) 2.28	(11) 2.24	107/4	174/3	110/-	184/6		
RYE.												
Budapest (b): Home grown (pengő p. quintal) . . . . .	13.95	14.05	14.25	14.30	14.93	14.87	14.51	10.89	10.79	13.4		
Berlin: Home grown (Reichsmarks per quintal) . . . . .	20.30	20.60	20.10	19.90	19.90	19.92	19.81	16.88	17.18	17.04		
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. quintal) . . . . .	8.93	9.15	8.97	9.56	9.96	9.98	n. q.	(12) 10.88	n. 7.65	14.57		
Minneapolis: No. 2 (cents p. 56 lbs.) . . . . .	40 1/2	40 1/2	40 1/2	38 1/2	42 1/2	43 1/2	36 1/2	66 1/2	42 1/2	80 1/2		
Groningen (c): Home grown (florins p. quintal) . . . . .	6.00	6.00	6.00	6.00	6.05	5.77	4.78	4.92	4.45	6.33		
BARLEY.												
Braila: Average quality (lei p. quintal) (3) . . . . .	285	300	310	310	325	321	294	240	232	304		
Winnipeg: No. 4 Western (cents p. 48 lbs.) . . . . .	38 1/2	38	36 1/2	38 1/2	39 1/2	38	29	41 1/2	26 1/2	51 1/2		
Chicago: Feeding (cents p. 48 lbs.) . . . . .	42	40	47	48	48	49	38	53 1/2	43 1/2	57 1/2		
Berlin: Home grown fodder (Reichsmarks per quintal) . . . . .	18.15	18.15	18.25	18.35	18.40	18.11	23.49	17.75	19.52	17.40		
Antwerp: Danube (francs p. quintal) . . . . .	85	85	87	91	91	88	84	83 1/2	78 1/2	107 1/2		
London: English malting (shillings p. 448 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	37/6	32/6	33/4	35/8	39/-		
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):												
Danubian 3 % . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	18/1	17/4	15/2	22/3		
Russian (Azoff-Black sea) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	(13) 17/3	13) 17/1	14/3	18/11		
Canadian Western, No. 3 . . . . .	21/3	21/7 1/2	21/6	22/3	22/7 1/2	22/6	16/5	22/1	15/11	27/-		
Californian malting (shillings p. 448 lbs.) . . . . .	n. 27/8	n. 29/-	n. 30/-	n. q.	n. q.	n. q.	31/8	29/11	27/8	32/6		
Groningen (c): Home grown winter (fl. p. quintal) . . . . .	6.40	6.40	6.60	6.65	7.10	6.48	5.48	6.81	4.97	7.55		

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) No. 2 Manitoba. — (4) 80-83 kg. p. hl. — (5) 78 kg. p. hl. — (6) No. 1 Hard Winter. — (7) On sample. — (8) 64 lbs. p. bushel. — (9) 63 lbs. p. bushel. — (10) 62 1/2 lbs. p. bushel. — (11) Price in \$ per quintal. — (12) 73 Kg. p. hl. — (13) Shipping August-September.

PRODUCTS, MARKETS AND DESCRIPTION	May 20, 1932	May 13, 1932	May 6, 1932	April 29, 1932	April 22, 1932	Average (1)				Commercial Season	
						April 1932	May 1932	May 1930			
										1930-31	1929-30
<b>OATS.</b>											
Braila: Good quality (lei p. quintal) . . . . .	320	380	315	315	305	305	331	218		247	256
Winnipeg: No. 2 White (cents per 34 lbs.) . . . .	38 3/4	35	34 1/2	38 3/4	32 7/8	32 1/2	29	50 3/8		30	58 1/8
Chicago: No. 2 White (cents per 32 lbs.) . . . .	24 1/2	24 1/2	24 1/4	21 3/4	23 3/4	23 3/4	28 7/8	42 1/8		32 7/8	44 1/8
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	5.50	5.65	5.65	5.75	5.70	5.64	3.94	4.30		3.58	5.30
Berlin: Home grown (Reichsmarks p. quintal) . .	16.65	16.65	16.65	16.35	16.35	16.42	19.48	15.77		16.17	15.62
Paris: Home grown, black and other (francs p. quintal) . . . . .	114.40	114.60	113.00	117.75	118.75	117.00	90.80	65.85		81.00	81.15
London: Home grown white (shillings p. 336 lbs.)	24/6	23/-	23/-	23/3	23/3	22/3	20/6	19/6		18/4	21/-
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.):											
Danubian (39-40 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	14/2	n.	12/1	2) n. 16/4
Plate (f. a. q.) . . . . .	15/-	15/3	15/6	15/-	15/3	14/10	11/4	12/6		10/9	16/1
Chilian Tawny . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	12/2	13/5		12/-	17/3
Milan (b): spot (lire p. quintal):											
Home grown . . . . .	76.50	n. 77.50	n. 77.50	n. 79.00	n. 76.50	n. 77.00	72.90	74.60		73.95	80.75
Foreign imported . . . . .	66.00	67.00	67.00	67.00	65.50	65.00	62.50	66.30		60.40	74.30
<b>MAIZE.</b>											
Braila: Danube (lei p. quintal) . . . . .	200	202	200	212	217	(3) 213	257	285		210	309
Chicago: No. 2 Mixed American (cents p. 56 lbs.) .	33	32	31 3/4	31 1/2	32 1/4	32 3/4	55 7/8	80 3/8		58 3/4	85 7/8
Buenos Aires (a): Yellow Plate (pesos paper p. quintal) . . . . .	4.57 1/2	4.50	4.47 1/2	4.42 1/2	4.77 1/2	4.64	3.84	3.00		3.82	6.17
Antwerp, spot (Belgian francs p. quintal):											
Bessarabian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	84 1/2	n. 99		71 1/4	n. 97 1/4
Cinquantino . . . . .	61	63	65	66	68	66 3/4	88	132 3/4		81	131 1/4
Yellow Plate . . . . .	54	58	63	64	65	63 1/4	77 3/4	115		65	109 1/4
London and Liverpool, parcels, c. i. f. (shillings p. 480 lbs.):											
Danube . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	23/1	n.	17/4	24/11
Yellow Plate . . . . .	18/-	18/3	18/3	18/4 1/2	18/7 1/2	18/10	15/0	24/10		15/6	25/3
No. 2 White African . . . . .	n. q.	4) 21/6	n. q.	n. q.	n. q.	n. q.	5) 19/10	25/5		n. 18/11	26/-
Milan (b): Home grown (lire p. quintal) . . . .	77.50	78.50	78.50	78.50	78.50	77.90	53.90	67.60		51.90	71.35
<b>RICE (CLEANED).</b>											
										1931	1930
Milan (b): Maratelli (lire p. quintal) . . . . .	159.00	160.00	160.00	157.00	155.00	153.80	128.20	157.00		117.35	152.15
Rangoon: No. 2 Burma (rupees p. 7500 lbs.) . .	n. q.	295	295	310	300	300	216	446		249 3/4	393 3/4
Saigon (Indochinese piastres p. quintal):											
No. 1 Round white (25 % broken) . . . . .	...	...	...	...	...	...	5.90	12.91		6.78	11.86
No. 2 Japan (40 % broken) . . . . .	...	...	...	...	...	...	5.37	12.37		6.20	10.89
London (a): c. i. f. (shillings p. 112 lbs.):											
Spanish Belloch, No. 3 oiled . . . . .	13/7 1/2	13/7 1/2	13/1 1/2	12/7 1/2	12/7 1/2	12/7	12/1	14/3		11/11	14/1
Italian good, No. 6 oiled . . . . .	14/4 1/2	14/4 1/2	14/4 1/2	14/4 1/2	14/-	14/1	15/4	14/9		13/7	14/11
American Blue Rose . . . . .	16/-	16/3	16/3	16/3	15/9	16/1	18/1	23/11		18/7	21/9
Burma, No. 2 . . . . .	8/10 1/4	9/13	9/13	9/8 1/4	9/1	9/1	7/1	12/1		7/11	10/11
Saigon, No. 1 . . . . .	8/7 1/2	8/9	8/10 1/4	9/13	8/10 1/4	8/9	7/1	12/6		8/1	11/3
Siam, Garden, No. 1 . . . . .	6) 8/9	n. q.	10/4 1/2	6) 10/6	6) 10/13	6) 10/1	8/7	15/9		9/5	14/-
Tokio: Various qualities (yens p. koku) . . . .	...	22.10	22.20	22.90	21.50	22.06	18.22	27.28		18.46	25.57
<b>LENSBED.</b>											
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	8.75	8.80	8.75	8.95	9.20	9.18	10.58	19.38		10.32	17.19
Antwerp: Plate (Belgian francs p. quintal) . . .	96	97	99 1/2	102	102 1/2	102 1/2	147 3/4	312		148	284 1/4
Hull, c. i. f.: Plate (p. sterling p. 1. ton) . . .	7-12-6	7-16-8	7-15-0	8-0-0	7-17-6	7-17-8	8-8-6	17-9-0		8-14-1	15-0-5
London, c. i. f.: Bombay boid (p. st. p. long ton).	10-17-8	11-0-0	10-15-0	11-10-0	11-5-0	11-7-0	11-6-0	19-11-0		11-9-6	17-14-4
Dunth: No. 1, Northern (cents p. 56 lbs.) . . .	120 1/2	126	126 1/2	132	138	136 1/2	152 1/4	268 1/2		148	286

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations; the annual averages on the monthly. — (2) Weight not indicated. — (3) Rectified price: 18 March: 25; average March: 24.5. — (4) Shipping July-August. — (5) White East African. — (6) Siam special. — (7) 25 April: 22.50; 5 April: 22.00; 1 April: 22.00; 15 March: 22.50; average March: 22.54.

PRODUCTS, MARKETS AND DESCRIPTION	May 20, 1932	May 13, 1932	May 6, 1932	April 29, 1932	April 22, 1932	Average (r)					
	1932	1932	1932	1932	1932	April 1932	May 1931	May 1930	Commercial Season	1930-31	1929-30
<b>COTTONSEED.</b>											
Alexandria: Sakellaridis (piastres per ardeb) . . . .	53.0	53.2	51.3	54.2	54.3	54.3	40.6	64.3	52.2	67.9	
Hull: Sakellaridis (p. sterl. per long ton) . . . .	5-7-6	5-10-0	5-6-3	5-11-3	5-10-0	5-11-0	5-6-3	6-10-0	5-12-6	6-18-2	
<b>COTTON.</b>											
New Orleans: Middling (cents per lb.) . . . . .	(3) 5.78	5.67	5.85	5.84	6.11	6.08	9.12	15.64	10.07	16.17	
New York: Middling (cents per lb.) . . . . .	(3) 5.85	5.65	5.90	5.85	6.10	6.13	9.40	16.47	10.38	16.60	
Bombay: M. g. Broach f. g. (rupees per 784 lbs.) .	167	167	172	180	182	182 ½	175 ½	251 ¾	191 ¾	283 ½	
Alexandria (a) (talaris per kantar):											
Sakellaridis f. g. f. . . . .	10.77	10.87	10.42	11.47	11.52	11.65	14.96	27 ½	17.12	28 ¾	
Ashmouni (Upper Egypt) f. g. f. . . . .	9.10	9.20	9.40	10.25	10.15	16.16	10.84	19 7/16	12.00	19 ¾	
Bremen: Middling (U. S. cents per lb.) . . . . .	6.87	6.78	6.81	7.27	7.48	7.40	10.51	17.46	11.59	18.27	
M. g. Broach fully good (pence per lb.) . . . .	n. 4.20	n. 4.20	n. 4.20	n. 4.50	n. 4.50	n. 4.59	n. 4.33	5.99	n. 4.63	n. 6.83	
Le Havre: Middling, Gulf (francs per 50 kg.) . . .	...	201	205	214	221	221	323	507	349	545	
Liverpool (pence per lb.):											
Middling fair . . . . .	n. 5.53	n. 5.53	n. 5.53	n. 5.82	n. 5.95	n. 5.86	n. 6.41	9.92	n. 6.93	n. 10.39	
Middling . . . . .	4.53	4.58	4.53	4.82	4.95	4.86	5.21	8.61	5.72	9.09	
São Paulo, good fair . . . . .	n. 4.78	n. 4.83	n. 4.78	n. 5.07	n. 5.20	n. 5.08	5.42	8.40	5.91	9.02	
M. g. Broach, fully good . . . . .	n. 4.07	n. 4.12	n. 4.09	n. 4.42	n. 4.52	n. 4.46	n. 4.08	n. 6.00	n. 4.25	n. 6.80	
Sakellaridis, fully good fair . . . . .	6.10	6.20	6.10	6.55	6.65	6.69	8.18	13.99	9.08	14.52	
<b>BUTTER.</b>											
									1931	1930	
Copenhagen (a) (Kr. p. quintal) . . . . .	146	150	156	158	180	167	193	217	200	245	
Maastricht, auction (b): Dutch (florins p. kg.) .	n. q.	0.94	1.03	1.03	1.03	1.00	1.30	1.50	1.33	1.70	
Hamburg, auction (b): Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . . .	117.36	119.82	119.35	116.78	116.06	116.71	124.98	127.40	131.22	146.67	
Kempten (b): Allgäu butter (Pfennige p. half kg.)	(4) 114	(4) 117	(4) 117	(4) 117	(4) 112	(4) 112	109	118	110	128	
London (c) (shillings p. cwt.):											
British blended . . . . .	130/8	130/8	130/8	130/8	135/4	134/5	140/11	154/-	140/4	158/8	
Danish . . . . .	110/-	112/-	114/-	120/-	124/-	132/-	122/5	138/-	133/4	153/6	
Irish creamery, salted . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	5) 109/8	137/-	119/3	134/10	
Dutch . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	120/-	138/10	132/1	151/11	
Argentine . . . . .	106/-	108/-	108/-	108/-	112/-	112/7	114/5	134/10	117/7	135/10	
Siberian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	5) 101/10	127/2	(5) 97/4	131/6	
Australian, salted . . . . .	102/-	105/-	108/-	110/-	112/-	111/7	112/5	136/-	116/8	135/9	
New Zealand, salted . . . . .	103/-	105/-	108/-	112/-	114/-	114/10	114/2	138/5	116/11	137/8	
<b>CHEESE.</b>											
Milan (lire per quintal):											
Parmigiano-Reggiano, 1st quality of last year's production . . . . .	(6) 900	(6) 900	(6) 900	1,050	1,025	1,015	1,112	1,177	1,103	1,160	
Green Gorgonzola, mature, choice . . . . .	450	450	460	455	455	475	681	650	616	671	
Rome: Roman pecorino, choice (lire p. quintal) .	1,312	1,312	1,312	1,287	1,287	1,287	1,130	1,225	1,121	1,207	
Alkmaar: Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small; florins, p. 50 kg.) . . . . .	21.00	20.00	20.00	20.00	21.00	21.40	32.62	39.00	32.63	40.83	
Gouda: Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.) . . . . .	18.50	18.00	20.00	20.00	20.00	21.30	36.20	41.40	37.93	45.56	
Kempten (b): (Pfennige per half kg.):											
Softcheese, green (20 % butterfat) . . . . .	20 ½	20 ½	20 ½	20 ½	20 ½	20 ½	20 ½	23	24	27	
Emmenthal from the Allgäu (whole milk cheese) 1st quality . . . . .	83	83	83	83	83	83	98 ½	(7) 100	97 ½	(7) 97	
London (c) (shillings per cwt.):											
English Cheddar . . . . .	120/-	120/-	120/-	120/-	120/-	120/5	106/-	123/2	99/10	103/4	
Canadian . . . . .	79/-	78/8	78/6	78/6	78/6	78/7	78/11	105/7	75/9	93/11	
New Zealand . . . . .	62/-	63/-	63/-	64/-	66/-	65/5	54/2	87/5	63/2	82/2	
Liverpool (c): Engl. Cheshire, ungraded (sh. p. cwt.)	(8) 84/-	(8) 84/-	137/8	137/8	137/8	137/8	(8) 77/11	(8) 81/2	94/3	96/6	

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday. — (r) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (s) 15 April: 5-11-3. — (t) 19 May. — (u) Quoting system changed: actual prices are generally 3 Pf. higher than according to the ancient system used in Kempten. — (v) Average calculated from the prices for the Fridays and the Thursdays which precede. — (w) Production of 1931. — (x) Average price for all qualities. — (y) New.

## THE PRICES OF AGRICULTURAL PRODUCTS IN APRIL 1932

In the following pages the index-numbers of prices of agricultural products and other price-indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled "Index-numbers of prices of agricultural products and other price-indices of interest to the farmer". We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilisation from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting formally to unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary tables is given below.

COUNTRIES	Percentage variations in the index-numbers for April, 1932			
	compared with those for March, 1932		compared with those for April, 1931	
	Index-numbers of prices of agricultural products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany . . . . .	— 1.9	— 1.4	— 12.6	— 13.5
England and Wales . . . . .	+ 3.5	— 1.9	— 4.9	— 2.3
Argentina . . . . .	— 4.4	—	— 1.5	—
Canada . . . . .	— 1.2	— 1.0	— 15.1	— 8.1
Estonia . . . . .	— 4.9	—	— 18.1	—
United States . . . . .	— 3.3	—	— 35.2	—
Finland . . . . .	— 2.0	— 0.8	— 29.8	— 10.6
Hungary . . . . .	— 5.2	— 3.3	0	+ 4.7
Italy . . . . .	— 2.2	— 2.0	+ 7.1	+ 4.3
New Zealand . . . . .	+ 2.7	— 1.0	+ 1.4	— 9.7
Netherlands . . . . .	+ 3.1	—	+ 0.5	—
Poland . . . . .	— 1.9	— 2.5	— 32.0	— 21.6
Yugoslavia . . . . .	+ 9.1	+ 2.5	— 8.5	— 11.7
	c) — 2.2	—	c) — 4.3	—
	d) — 2.5	— 2.5	d) — 28.9	— 12.5

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

# INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER \*

COUNTRIES AND CLASSIFICATION	April	March	Feb.	Jan.	Dec.	Nov.	April	April	Year	
	1932	1932	1932	1932	1931	1931	1931	1930	1931	1930
<b>GERMANY</b>										
(Statistisches Reichsamt)										
1913 = 100.										
Foodstuffs of vegetable origin . . . . .	122.4	121.6	119.5	115.3	112.8	115.6	129.7	117.6	119.3	115.3
Livestock . . . . .	64.2	65.6	65.7	65.7	68.4	71.4	83.3	113.3	83.0	112.4
Livestock products . . . . .	90.3	97.6	95.5	92.1	101.1	107.4	105.7	110.2	108.4	121.7
Feeding stuffs . . . . .	99.7	99.0	93.5	92.0	93.6	98.7	113.9	99.2	101.9	93.2
Total agricultural products . . . . .	94.7	96.5	94.6	92.1	94.5	98.5	108.3	112.1	103.3	113.1
Fertilizers . . . . .	71.7	72.2	72.0	71.3	70.4	72.1	80.1	86.1	76.5	82.4
Agricultural dead stock . . . . .	117.0	117.2	118.9	122.6	128.3	128.6	181.2	140.2	130.7	139.4
Finished manufactures ("Gebrauchsgüter") . . . . .	119.9	121.5	123.6	126.9	132.4	134.2	142.4	161.8	140.1	159.3
General index-number . . . . .	98.4	99.8	99.8	100.0	103.7	106.6	113.7	126.8	110.9	124.6
<b>ENGLAND AND WALES</b>										
(Ministry of Agriculture)										
Average of corresponding months										
1911-13 = 100.										
Agricultural products . . . . .	117	113	117	122	117	112	123	137	120	134
Feeding stuffs . . . . .	99	102	97	95	93	97	88	106	83	96
Fertilizers . . . . .	91	91	91	91	91	90	100	102	96	101
General index-number (1). . . . .	97.0	98.9	102.0	99.6	100.5	97.6	99.3	119.4	97.7	114.1
<b>ARGENTINA (2)</b>										
(Banco de la Nación Argentina)										
1926 = 100.										
Cereals and linseed . . . . .	61.3	63.1	59.1	55.3	58.2	65.6	51.2	93.2	55.8	82.3
Meat . . . . .	70.4	70.5	72.3	72.2	77.1	84.3	93.9	113.1	91.6	110.9
Hides and skins . . . . .	47.8	61.6	61.8	62.7	59.1	66.3	70.5	70.6	64.5	71.6
Wool . . . . .	46.1	48.7	49.4	49.1	51.7	53.0	57.7	67.1	61.2	67.4
Dairy products . . . . .	58.7	58.8	58.9	58.3	63.6	70.7	73.6	85.0	74.5	82.4
Forest products . . . . .	66.3	73.3	73.3	79.3	80.5	81.7	103.7	106.8	99.3	107.9
Total agricultural products . . . . .	60.5	63.3	61.0	58.9	61.4	68.6	61.4	93.0	63.3	85.5
<b>CANADA (2)</b>										
(Internal Trade Branch										
of the Dominion Bureau of Statistics)										
1926 = 100.										
Field products (grain, etc.) . . . . .	44.5	43.7	43.7	42.0	42.2	43.0	47.3	82.1	44.6	70.0
Animals and animal products . . . . .	62.1	65.2	66.2	68.8	71.1	72.1	81.8	111.7	77.6	102.9
Total Canadian farm products . . . . .	51.1	51.7	52.1	52.0	53.0	55.8	60.2	93.2	57.0	82.3
Fertilizers . . . . .	71.4	72.0	72.0	71.0	71.1	75.5	86.5	83.9	63.0	88.2
Consumer's goods (other than foodstuffs etc.) . . . . .	78.3	78.9	79.7	79.3	79.9	79.3	80.1	87.5	80.5	86.8
General index-number . . . . .	68.4	69.1	69.2	69.4	70.3	70.6	74.4	91.7	72.6	86.6
<b>ESTONIA</b>										
(Central Bureau of Statistics)										
1913 = 100.										
Commodities imported (3). . . . .	114	113	112	117	125	124	133	116	129	118
Commodities exported . . . . .	62	63	64	60	64	70	78	105	76	103
Agricultural products imported and exported (3)	77	81	73	76	81	85	94	109	91	108

\* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930), as well as to pages 77 to 79 of the "Crop Report" of January 1932.

(1) Calculated by the "Statist", reduced to base-year 1913 = 100. — (2) Average data for the year 1931 are provisional. —

(3) From January 1932 the price of rye is excluded from the calculations.

COUNTRIES AND CLASSIFICATION	April	March	Feb.	Jan.	Dec.	Nov.	April	April	Year	
	1932	1932	1932	1932	1931	1931	1931	1930	1931	1930
UNITED STATES (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals . . . . .	50	51	51	52	52	57	74	110	68	100
Fruits and vegetables . . . . .	78	73	68	70	68	68	120	187	98	158
Meat animals . . . . .	66	69	65	68	68	76	106	146	98	134
Dairy products . . . . .	74	76	79	85	92	95	99	126	94	123
Poultry and poultry products . . . . .	60	61	70	87	120	123	90	117	98	126
Cotton and cottonseed . . . . .	46	50	47	45	45	50	78	120	68	102
Total agricultural products . . . . .	59	61	60	63	66	71	91	127	80	117
Commodities purchased by farmers (1) . . . . .	114	115	116	118	123	123	132	150	129	146
Agricultural wages (1) . . . . .	—	94	—	98	—	—	127	162	116	152
UNITED STATES (Bureau of Labor) 1926 = 100.										
Grains . . . . .	44.5	43.5	46.1	46.7	47.0	51.3	59.5	84.1	53.0	53.3
Livestock and poultry . . . . .	49.2	51.4	50.3	53.4	51.7	55.7	70.3	96.9	63.9	89.2
Other farm products . . . . .	51.2	52.1	52.7	54.8	61.2	63.1	73.4	99.0	69.2	91.1
Total farm products . . . . .	49.2	50.2	50.6	52.3	55.7	58.7	70.1	95.8	64.8	83.3
Agricultural implements . . . . .	85.0	85.0	85.1	85.5	92.1	92.1	94.7	95.0	94.0	95.1
Fertilizer materials . . . . .	70.1	68.6	69.3	69.9	70.1	70.1	80.6	88.1	73.8	85.6
Mixed fertilizers . . . . .	71.1	73.2	73.7	75.5	77.1	77.7	83.5	94.4	82.0	93.6
Cattle feed . . . . .	53.4	52.4	48.2	53.0	53.9	59.3	81.2	117.1	62.7	99.7
Non-agricultural commodities . . . . .	68.9	69.3	69.6	70.3	69.3	71.0	74.3	89.4	73.0	85.9
General index-number . . . . .	65.5	66.0	66.3	67.3	66.3	68.3	73.3	90.7	71.1	86.3
FINLAND (Central Bureau of Statistics) 1926 = 100.										
Cereals . . . . .	89	92	94	96	93	81	76	83	77	76
Potatoes . . . . .	69	69	68	68	54	49	69	89	68	76
Fodder . . . . .	70	70	71	73	71	62	71	63	63	62
Meat . . . . .	61	67	63	57	57	51	66	95	64	88
Dairy products . . . . .	74	78	84	90	92	88	73	81	76	84
Total agricultural products . . . . .	78	77	73	78	73	72	73	85	72	82
General index-number . . . . .	89	92	93	94	92	87	85	92	84	90
HUNGARY (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products . . . . .	90	92	90	89	89	89	84	83	—	—
General index-number . . . . .	97	99	99	98	99	99	93	96	—	—
ITALY (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products . . . . .	361.18	351.62	349.57	350.71	342.35	336.84	356.36	426.89	343.11	413.39
General index-number . . . . .	313.79	322.14	323.49	325.92	325.54	328.74	355.10	429.24	341.57	411.04
NEW ZEALAND (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce . . . . .	99.5	99.3	90.8	91.5	97.5	102.6	89.4	117.7	99.3	12

COUNTRIES AND CLASSIFICATION	April	March	Febr.	Jan.	Dec.	Nov.	April	April	Year	
	1932	1932	1932	1932	1931	1931	1931	1930	1931	1930
<b>NORWAY (1)</b> (Kgl. Seiskap for Norges Vel) Average 1909-14 = 100.										
Cereals . . . . .	123	123	122	123	110	110	105	128	112	114
Potatoes . . . . .	151	150	140	137	126	119	137	113	150	152
Pork . . . . .	85	88	93	95	90	88	74	123	86	98
Other meat . . . . .	113	119	120	113	126	121	162	204	138	198
Eggs . . . . .	70	81	87	90	114	132	85	106	96	121
Dairy products . . . . .	119	123	130	129	136	133	133	149	129	150
Concentrated feeding stuffs . . . . .	104	106	108	109	108	102	111	129	103	117
Maize . . . . .	87	87	88	86	85	81	85	120	82	103
Fertilizers . . . . .	89	89	91	91	86	86	96	105	90	101
<b>NETHERLANDS</b> (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil . . . . .	56	56	60	58	57	59	78	58	(2) 72	(2) 68
Animal products . . . . .	49	51	54	53	53	57	74	89	(2) 77	(2) 95
Total agricultural products . . . . .	51	52	55	54	54	58	75	81	(2) 76	(2) 88
Agricultural wages . . . . .	95	95	95	95	95	95	95	100	(2) 99	(2) 100
General index-number (3) . . . . .	54.1	55.5	56.2	56.8	57.4	60.2	69.0	82.5	65.7	79.2
<b>POLAND (4)</b> (Central Bureau of Statistics) 1927 = 100.										
Products of the soil . . . . .	61.7	57.1	53.3	52.7	58.0	59.1	64.7	55.8	53.9	52.1
Products of agricultural industry . . . . .	71.5	67.1	64.5	62.6	66.2	68.7	75.4	75.4	65.9	69.9
Total products of plant origin . . . . .	66.8	62.3	59.3	57.8	62.4	64.2	70.8	65.0	60.0	60.5
Animals . . . . .	49.7	32.6	37.3	37.5	41.3	43.7	55.9	90.8	56.8	82.4
Dairy products . . . . .	51.4	53.7	68.5	56.9	68.0	76.9	61.6	71.1	68.0	81.5
Total products of animal origin . . . . .	50.8	45.6	49.5	45.4	51.8	56.4	53.5	81.5	60.8	81.9
Total agricultural products . . . . .	59.0	54.1	54.5	51.3	57.2	60.3	64.6	71.3	59.7	63.6
Fertilizers . . . . .	94.1	94.1	94.1	108.4	108.4	118.5	124.7	105.0	120.2	127.8
Industrial products . . . . .	70.2	71.6	73.0	74.4	74.0	74.5	82.1	96.5	79.4	94.0
General index-number . . . . .	65.4	63.8	64.6	63.9	66.4	68.2	74.1	85.0	70.5	82.3
<b>YUGOSLAVIA</b> (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil . . . . .	74.3	76.0	70.3	69.0	70.6	70.9	77.6	95.3	74.3	89.3
Animal products . . . . .	53.6	55.0	57.6	60.5	58.6	63.6	75.4	99.2	72.2	96.3
Industrial products . . . . .	66.2	68.3	68.8	69.2	68.5	68.7	73.9	82.1	71.4	81.8
General index-number . . . . .	66.1	67.8	67.3	67.3	67.2	68.6	75.5	89.6	72.9	86.6

(1) The agricultural years refer to the period April 1-March 31. — (2) Agricultural year July 1-June 30. — (3) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100. — (4) Average data for the year 1931 are provisional.



## RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	May	May	May	April	April	Average				Commercial Season
	30,	13,	6,	29,	22,	April 1932	May 1931	May 1930		
	1932	1932	1932	1932	1932					
SHIPMENTS OF WHEAT AND MAIZE.										
									1930-31	1929-30
Danube to Antwerp/Hamburg . . . . .	(shill. per	13/6	13/6	n. 14/6	n. 14/6	14/6	13/6	14/4	13/11	15/8
Black Sea to Antwerp/Hamburg . . . . .	long ton)	n. q.	n. 10/6	n. 10/6	n. 10/6	10/6	10/7	10/4	10/10	n. q.
St. John to Liverpool (1) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	2/-	1/9½	n. q.	n. q.	1/6
Montreal to United Kingdom . . . . .	(shill. per	(2) 0.08	2)0.08½	2)0.08½	2)0.08½	(2) 0.09	(2) 0.08	2/2	1/10	1/10
Gulf to United Kingdom . . . . .	480 lbs.)	n. 2/5	n. 2/3	n. 2/3	2/3	(2) 0.10	2/7	2/2	2/1	2/3
New York to Liverpool (2) . . . . .		1/6	1/6	1/6	1/6	1/6	1/7½	1/6	1/6	1/6
Northern Range to U.K. and Continent	n. q.	n. q.	n. q.	n. q.	(2) 0.09	(2) 0.09	2/-	n. 1/9	1/9	1/9
North Pacific to United Kingdom (sh. per long ton) .	n. 21/-	n. 21/6	21/-	n. q.	n. q.	22/4	23/6	20/5	22/3	22/7
Vancouver to Yokohama (1) (gold \$ per sh. ton) . .	2.20	(3) 2.20	(3) 2.20	2.20	2.20	2.20	2.20	2.79	2.56	2.72
La Plata Down River (4) to U. K./Continent		14/9	15/6	16/-	17/-	17/6	16/6½	18/3	10/4	16/4
La Plata Up River (5) to U. K./Continent	(shill. per	16/9	17/-	17/6	18/6	18/6	17/11	19/9	12/-	18/-
Karachi to U. K./Continent (6) . . . . .	long ton)	n. q.	21/6	21/6	n. q.	n. q.	n. q.	19/6	n. 13/9	19/3
Western Australia to U.K./Continent . . . . .		23/6	(7) 25/-	(7) 24/-	25/6	27/-	26/10	28/8	24/7	29/8
SHIPMENTS OF RICE.										
									1931	1930
Saigon to Europe . . . . .	(shill. per	n. 22/-	22/-	22/-	(1) 23/9	(1) 23/9	(1) 23/9	25/7	(1) 17/6	24/3
Burma to U.K./Continent . . . . .	2240 lbs.)	n. q.	23/9	n. q.	24/6	27/-	26/1	23/11	n. 17/8	n. 18/11

(1) Rates for parcels by liners. — (2) Freight in gold \$ per 100 lbs. (in the case of a loss of 25 % in the value of the shilling, to \$ c. per 100 lbs. are equal to 2/3 per quarter). — (3) Vancouver-Vladivostok: Can. \$ 2.40 to 2.75 per sh. ton. — (4) "Down River", includes the ports Buenos Aires and La Plata. — (5) "Up River" includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight. — (6) The original data being quoted in "scale terms", 10 % is added to arrive at freights per long ton. — (7) Australia-Vladivostok: 17/6 to 18/- per long ton.

## EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	May 20, 1932	May 13, 1932	May 6, 1932	April 29, 1932	April 22, 1932
Germany . . . . .	Berlin	—	0.4	—	0.4	—
Argentina . . . . .	New York	—	39.3	—	39.3	—
Belgium . . . . .	Brussels	+	0.9	+	1.1	+
Canada . . . . .	New York	—	12.4	—	10.6	—
Denmark . . . . .	Copenhagen	—	25.2	—	25.2	—
Egypt . . . . .	London	—	24.5	—	24.4	—
France . . . . .	Paris	+	0.8	+	0.7	+
Great Britain . . . . .	London	—	24.5	—	24.4	—
Hungary . . . . .	Budapest	—	0.0	—	0.0	—
India . . . . .	London	—	24.8	—	24.6	—
Indo-China . . . . .	Paris	+	0.8	+	0.7	+
Italy . . . . .	Milan	—	2.1	—	1.9	—
Japan . . . . .	New York	—	37.0	—	34.3	—
Netherlands . . . . .	Amsterdam	+	0.9	+	1.0	+
Rumania . . . . .	New York	+	0.3	+	1.2	+

(1) The percentage represents the premium or the loss as far as possible on the national exchange. By the aid of the table of reciprocal parities of the currencies, considered and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Crop Report refer.

## LATEST INFORMATION

*Great Britain and Northern Ireland* : Increases in the areas of other crops in Northern Ireland in 1932 have taken place at the expense of flax. It is evident that owing to the low prices offered at markets the decline in flax area is continuing.

In Northern Ireland, owing to the adverse effect of the cold weather on pastures, hand-feeding of outlying cattle assumed a greater importance than usual ; where this has been carried out the animals are in particularly good condition but outliers that have not been hand-fed have lost a little in condition as a result of the cold spring and the scarcity of grass. The general health of both cattle and sheep is satisfactory. Very few complaints of disease have been received. Dairy stock are in good health.

Milk supplies in Northern Ireland increased but were still a little below the average for April due to some extent to the growth of grass being three to four weeks later than usual.

*Czechoslovakia* . The area sown to hemp this year (15,400 acres) is 24.9 % smaller than that of 1931 (20,600 acres) and 35.8 % smaller than the five-year average (24,000 acres). For colza the data are as follows: 3,360 acres in 1932 ; 5,040 in 1931 and 4,440 the average for the five years ending 1930. Percentages 66.7 and 75.7.

The area sown to maize is estimated at 355,000 acres against 347,000 in 1931 and the five year average of 349,000. Percentages : 102.3 and 101.8. For flax the respective figures are as follows : 20,100 ; 22,900 and 46,200 ; 87.7 % and 43.5 %.

*Argentina* : On May 21 sowing operations were progressing well. It is forecast that this year the wheat area will be increased by 10 %, that is, by about 1.7 million acres compared with last year when 17 million acres were sown. There is forecast, on the contrary, a decrease of 10 % in the flax area which last year was 8.6 million acres.

# MONTHLY CROP REPORT

## AND AGRICULTURAL STATISTICS

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*The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country : Germany, Austria, Hungary, Luxemburg and Czechoslovakia : 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad ; France : 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad ; Lithuania, Poland, Sweden and Switzerland : 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad ; Netherlands : 90 = excellent, 70 = good, 60 = fairly good, 50 = below average ; U. S. S. R. : 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad ; Canada 100 = crop condition allowing a yield equal to the mean of a long series of years ; United States : 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed : 100 = crop condition which promises a yield equal to the average of the last ten years.*

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1932

No. 6

### CEREAL CROP CONDITION AND PRODUCTION PROSPECTS

EUROPE. — The persistence of winter conditions until the end of April led to a considerable delay in the growth of cereals which formed the dominant feature of the crop situation in nearly all European countries at the beginning of May. To ensure a successful outcome of the season there was consequently on the whole a need for very favourable weather conditions during the months to elapse before harvest. It may be stated that in most of Europe the month of May in general responded to the growth requirements of cereals. Although in the first half of May in a number of European countries the temperature did not rise notably rains fell in the regions that needed them. During the latter half of the month the weather was favourable almost everywhere and crop progress, which was not very noticeable in the first part of May, was considerably hastened by the gradual increase in warmth and by the alternation of rain and sun which were characteristic of the period. The crop situation on 1 June was on the whole much better than in the previous month and considerably superior to that of last year at the same date. The information available on the course of the weather during the first half of June in the principal producing countries is also, in general, satisfactory.

In a large region covering roughly the North and Centre of France, Belgium, Great Britain and the Netherlands, arrears of crop growth were, however, made up only in small part, due to the persistence of bad weather and lack of the necessary warmth and sunshine. In the countries of Southern Europe where harvesting begins in the latter half of June, crop prospects were generally very good. Spain announces a crop fairly closely approaching the record obtained in 1925 ; in Italy, despite some damage due to shrinkage in Sicily and Apulia, it is anticipated that production will not be smaller than that of last year ; Greece, Bulgaria and Yugoslavia are counting upon heavy crops. The Hungarian crop should, however, be a little below the average and it seems that Rumania can count only upon a nearly average production.

In Central and Northern Europe, where the harvest period is more distant, the situation of standing crops varies from country to country. In France the final crop result is uncertain ; the appearance of standing cereals is in general satisfactory, despite continual rainy weather in May and June but it is increasingly feared that the persistence of bad weather may cause serious damage. Although uncertain the present situation

of French crops is much better than that of the past year and only a succession of abnormal adversities could reduce production to the low level of 1931.

In Germany there are in prospect excellent crops of both wheat and rye on larger areas than last year; in Poland and Czechoslovakia, where complaints of drought and cold were made, the situation, which was nearly average at the beginning of June, subsequently somewhat improved.

### UNITED STATES. — *Winter wheat.*

Year of production	Area		% of area not harvested	Crop condition on June 1st	Yield per acre				Production			
	Sown	Harvested			Forecasted at June 1st		Actually obtained		Forecasted at June 1st		Actually obtained	
					centals	bushels	centals	bushels	thousand centals	thousand bushels	thousand centals	thousand bushels
1932 . .	38,682	(1) 32,277 (2)	16.6	64.7	7.6	12.7	...	...	246,600	411,000	...	...
1931 . .	43,149	41,009	5.0	84.3	9.6	16.1	11.5	19.2	389,400	649,000	472,479	787,465
1930 . .	43,630	39,509	9.4	71.7	8.3	13.8	9.1	15.2	319,481	532,469	361,104	601,840
1929 . .	43,340	40,580	6.4	79.6	9.3	15.4	8.5	14.2	373,289	622,148	346,205	577,009
1928 . .	47,317	36,213	23.5	73.6	8.5	14.2	9.6	16.0	307,513	512,252	347,204	578,673
1927 . .	43,373	37,723	13.0	72.2	8.5	14.2	8.8	14.7	322,201	537,001	331,648	552,747
1926 . .	39,887	36,987	7.3	70.5	8.8	14.6	10.2	17.0	325,800	543,000	376,460	627,433
1925 . .	39,951	31,346	21.5	66.5	7.8	12.4	7.7	12.8	244,294	407,156	241,242	402,070
1924 . .	38,916	35,656	8.4	74.0	8.6	13.8	10.0	16.6	305,591	509,319	355,355	592,250
1923 . .	46,001	39,508	14.3	76.3	8.8	14.7	8.7	14.5	348,325	580,541	343,066	571,777
1922 . .	47,930	42,353	11.6	81.9	8.6	15.9	8.3	13.8	364,200	607,000	352,127	586,878
1921 . .	45,625	43,414	4.8	77.9	8.0	14.9	8.3	13.8	346,900	578,000	390,190	600,316
1920 . .	44,861	40,016	10.8	78.2	7.6	14.8	9.2	15.3	302,400	504,000	396,358	610,597
1919 . .	51,483	50,494	1.9	94.9	10.6	18.2	9.0	15.1	536,800	893,000	456,226	760,377
1918 . .	43,126	37,130	13.9	83.8	9.5	16.1	9.1	15.2	352,149	586,915	339,059	565,099
1917 . .	38,859	27,257	28.9	70.9	8.2	13.5	9.1	15.1	223,800	373,000	247,741	412,901
1916 . .	39,245	34,709	11.6	73.2	8.1	14.2	8.3	13.8	281,400	469,000	288,332	480,553
1915 . .	42,431	41,308	2.6	85.8	9.8	16.8	9.8	16.3	405,600	676,000	404,368	673,947
1914 . .	37,158	36,008	3.1	92.7	10.6	18.0	11.4	19.0	382,800	638,000	410,994	684,000
1913 . .	33,274	31,699	4.7	83.5	9.3	15.9	9.9	16.5	295,200	492,000	314,137	523,561

1) Area to be harvested. — (2) Percentage of area abandoned at May 1st.

Summarising, prospects for the European harvest, which will be effected on an area about the same as that of last year in the case of wheat and on a rather considerably larger one for rye, appear to indicate a production at least as large as that of 1931 for wheat and much larger for rye, of which last year's crop was deficient.

As regards the U. S. S. R. May was fairly favourable to good development of winter cereals, the rains having been fairly regularly distributed. A yield at least average is expected on an area wider than in 1931. Sowings of spring wheat were very late but the moisture necessary for regular germination was not, as in 1931, lacking and the first stages of growth may be considered satisfactory. It appears however that the area of spring wheat sowings proposed under the Plan will not be attained and it may now be said that the area sown will probably remain about 7 million acres less than that in 1931. The total area under wheat in the U. S. S. R. should therefore in the current season be about 5 million acres less than last year. In the first half of June crop condition remained favourable; in the middle of the month however deficiency of rains and intense heat were reported in some spring wheat regions.

In North America May was not favourable to winter wheat and the estimate based on crop condition on 1 June is about 30 million bushels below that calculated on 1 May. The production forecast for this year is one of the smallest in the last twenty years; even allowing for possible improvements with the somewhat better weather that prevailed in the first half of June the resulting increase will not in all probability be of more than minor importance. On the other hand the development of spring wheat has so

far been entirely satisfactory ; private estimates of the spring wheat crop place it at about 260 million bushels as against scarcely 105 million last year following on the severe drought. Even assuming that the spring crop is as abundant as expected the total production of the United States will not however be sufficient for the normal needs of internal consumption, at present calculated at 700 million bushels per annum. The great accumulation of old crop stocks, considered to exceed 360 million bushels, will be sufficient to meet the internal deficit, which in any case seems at present quite small, and at the same time leave available for export in 1932-33 a very large quantity.

In Canada crop condition, already good at the end of May thanks to frequent rains and good soil moisture, further ameliorated in the first half of June. In the Prairie Provinces the necessary rains fell in sufficient amount and were well distributed. Expectations therefore are of a crop above the average ; private estimates place it at about 450 million bushels against the 305 million in 1931.

The latest report from British India indicates a slight decrease in wheat production from 347.6 to 340.9 million bushels. Amongst the other Asiatic producing countries Syria and Palestine expect a somewhat deficient crop owing to the spring drought.

In North Africa the wheat crop appears abundant in Tunisia and Egypt, fairly abundant in Morocco and practically average in Algeria.

In conclusion on the basis of the situation in mid June it may be said that in the northern hemisphere outside the U. S. S. R. the crop will probably be slightly below that of 1931 for wheat and rather above it for rye. In the U. S. S. R. a wheat crop somewhat better than that of 1931, which was greatly reduced by the effects of the drought on the spring wheat, is promised and a fairly abundant rye crop as last year. Sowings in the southern hemisphere continue under very favourable conditions over areas larger than those of last year.

G. C.

## CEREALS

*Germany* : Higher temperatures in May and heavy rains favoured the growth of cereals. Spring cereals have braided well.

At the beginning of June the crop condition of spelt was 2.5 against 2.7 on 1 May 1932 and 2.7 on 1 June 1931.

*Austria* : The first ten days of May were characterised by cold and very changeable weather. Precipitation during this period was not very abundant. From the 10th to the 20th the weather was warm and dry, giving rise to some complaints of drought. On about the 20th severe storms sporadically caused appreciable damage.

Winter cereals which were backward at the beginning of May, grew faster after the rains and warm weather at the beginning of the month.

Towards the middle of May the spring sowings were finished. The last sowings have come up slowly and irregularly.

*Belgium* : Apart from some very hot days which greatly encouraged growth, May was rainy and rather cold. At the end of the month growth was 10-15 days in arrear compared with a normal year.

Winter cereals have grown very well and at the end of the month were vigorous and very promising. Oats, which suffered from cold at the beginning, greatly improved.

*Bulgaria* : Frequent rains during the first half of May, despite the improved weather conditions in the latter half, retarded the growth of cereals by about a month. Crop condition of cereals on 1 June was, however, good.

The areas sown this year to meslin (252,000 acres) and to spelt (24,700) are a little smaller than those of last year but slightly (4 %·5 %) above the average of 1926-1930.

*Spain*: May weather greatly favoured cereals. Beneficial rains fell in abundance and completely repaired the in general not very large damage caused by the somewhat prolonged winter. These rains, together with the good conditions under which sowings were accomplished, and the fact that the reduction in area compared with 1931 is small, promise to result in one of the best productions of cereals obtained in the last ten years.

*Production of cereals in Spain.*

		* 1932	1931	Average 1926-1930	% 1932	Average = 100
		—	—	—	1931	—
Wheat . . . . .	(000 centals)	96,871	80,657	85,802	120.1	112.9
	(000 bushels)	161,448	134,426	143,001		
Rye . . . . .	(000 centals)	13,370	11,817	12,420	113.1	107.6
	(000 bushels)	23,875	21,102	22,179		
Barley . . . . .	(000 centals)	55,577	43,548	45,265	127.6	122.8
	(000 bushels)	115,788	90,727	94,304		
Oats . . . . .	(000 centals)	14,334	13,335	13,333	107.5	107.5
	(000 bushels)	44,794	41,670	41,664		

\* Estimate

*Estonia*: Cold weather in April was unfavourable for the growth of crops whereas during the first half of May temperatures were favourable and crops improved considerably.

According to agricultural correspondents' estimates, condition of winter crops on May 15 was a little above the average.

*Irish Free State*: The growth of all crops was retarded by the cold, harsh weather which prevailed during the greater part of May. Otherwise crops were in satisfactory condition at the beginning of June, no damage having been occasioned by storms, disease or pests.

*France*: The figures of crop condition given in the table were estimated in the latter half of April; they can therefore give only a very approximate indication of crop prospects; it is moreover evident that no correspondence exists between the more or less high figures given for crop condition of the various cereals as on 1 May and the quantity of production. If, however, account is taken of the weather conditions which have prevailed since the end of April, some conclusions may be drawn from the figures of crop condition calculated as at this date. It may be noted, first, that in contrast to last year, it is the southern regions which have suffered most from the unfavourable conditions of the season; in these regions growth is more advanced and as reaping, despite delay by bad weather, should be effected between the end of June and the beginning of July, the persistence of rainy weather, the relatively low temperatures and the absence of sunshine during the period of flowering and grain formation render the prospect of a good crop, as regards both quality and quantity, rather improb-

# Area and Crop Condition.

COUNTRIES	AREA SOWN					CROP CONDITION (†)										
	1931-32	1930-31	Average 1925-20 to 1929-30	% 1931-32		1-VI-1932			1-V-1932			1-VI-1931				
				1930-31 = 100	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)		
															Thousand acres	
WHEAT.																
Germany. . . . .	(w)	4,880	4,652	3,804	104.9	128.3	2.6	—	—	—	2.8	—	—	2.7	—	—
	(s)	...	702	384	...	...	2.6	—	—	—	—	—	—	2.6	—	—
*Austria . . . . .	(w)	...	485	482	...	...	2.6	—	—	—	2.8	—	—	2.7	—	—
	(s)	...	22	27	...	...	2.6	—	—	—	—	—	3.1	2.5	—	—
Belgium . . . . .	(w)	388	389	396	99.5	97.9	...	...	...	...	...	...	...	...	95	...
Bulgaria . . . . .	(w)	2,906	2,964	2,754	98.1	105.5	125	...	...	...	125	...	...	145	...	...
Spain . . . . .	(w)	10,601	11,245	10,786	94.3	98.3	d)	...	...	...	(x)102	...	...	...	...	...
*Estonia . . . . .	(w)	...	38	31	...	...	...	...	...	...	...	...	...	...	...	...
Finland . . . . .	(w)	30	32	26	92.3	112.3	e)	...	...	...	...	...	...	...	...	...
France . . . . .	(w)	12,973	11,725	12,650	110.6	102.6	...	...	...	...	...	...	71	...	...	...
	(s)	283	769	402	86.9	70.4	...	...	...	...	...	...	71	...	...	...
*Scotland . . . . .	(w)	...	50	57	...	...	...	100	...	...	...	...	100	...	95	...
Italy . . . . .	(w)	12,085	11,995	(2) 11,909	100.3	101.1	...	...	...	...	...	...	...	...	...	...
*Latvia . . . . .	(w)	...	149	105	...	...	115	...	...	...	...	...	...	...	90	...
Lithuania . . . . .	(w)	376	410	264	91.7	142.6	3.4	...	...	...	3.2	...	...	...	3.0	...
	(s)	...	100	138	...	...	3.4	...	...	...	...	...	...	3.3	...	...
Luxemburg . . . . .	(w)	22	23	30	97.8	73.9	2.1	...	...	...	2.6	...	...	...	w) 3.2	...
Malta . . . . .	(w)	10	10	9	99.2	103.9	...	...	...	...	...	...	...	...	...	...
*Netherlands . . . . .	(w)	...	192	137	...	...	79	...	...	...	79	...	...	...	63	...
Poland . . . . .	(s)	3,848	4,137	3,255	93.0	118.2	...	...	...	...	...	...	(x)2.8	(x)3.4	...	...
	(w)	...	358	222	...	...	...	...	...	...	(x)3.1	...	(x)3.2	...	...	...
*Romania . . . . .	(w)	5,596	6,154	—	90.9	—	...	...	...	...	...	...	e)	...	...	...
	(s)	...	532	457	...	...	3.5	...	...	...	...	...	...	...	2.7	...
*Sweden . . . . .	(w)	125	125	122	100.0	102.4	...	...	...	...	95	...	...	92	...	97
Switzerland . . . . .	(w)	1,937	1,962	1,815	98.8	106.7	...	...	...	...	...	...	8.0	...	2.9	...
Czechoslovakia . . . . .	(s)	96	98	92	98.4	104.8	...	...	...	...	...	...	...	...	2.6	...
Yugoslavia . . . . .	(w)	5,218	5,275	4,738	98.9	110.1	...	...	...	...	...	...	...	...	...	...
U. S. S. R. . . . .	(w)	32,387	29,040	(2) 24,460	111.4	132.2	...	...	...	...	...	...	...	...	...	...
Total Europe { (w)		58,728	55,811	53,052	99.8	105.0	...	...	...	...	...	...	...	...	...	...
	(s)	88,065	84,851	77,512	103.8	113.6	...	...	...	...	...	...	...	...	...	...
Canada (3). . . . .	(w)	496	561	833	88.5	59.6	...	100	...	...	...	...	100	...	97	...
	(s)	24,671	25,554	23,092	96.5	106.8	...	...	...	...	96	...	...	...	80	...
United States . . . . .	(w)	32,261	41,009	38,202	78.7	84.4	...	...	...	...	64.7	...	...	75.1	84.3	...
	(s)	...	13,940	21,243	...	...	...	...	...	...	84.5	...	...	...	...	87.9
Mexico . . . . .	(s)	1,092	1,501	1,278	72.8	85.5	...	...	...	...	...	...	...	...	...	...
Total America . . . . .		58,520	68,625	63,405	85.3	92.3	...	...	...	...	...	...	...	...	...	...
India (4) . . . . .	(w)	33,768	32,031	31,477	105.4	107.3	...	...	...	...	...	...	f)	...	...	f) g)
*Japan . . . . .	(w)	...	1,231	1,185	...	...	...	f)	...	...	...	...	f)	...	...	...
Syria and Lebanon . . . . .	(w)	1,191	1,168	1,118	102.0	106.5	...	...	...	...	102	...	...	...	...	...
Total Asia . . . . .		34,959	33,199	32,595	105.3	107.2	...	...	...	...	...	...	...	...	...	...
Algeria . . . . .	(w)	3,573	3,640	3,738	98.2	95.6	...	100	...	...	...	...	85	...	...	75
Cyrenaica . . . . .	(w)	6	18	31	32.7	18.4	...	...	...	...	...	...	...	...	100	...
*Egypt . . . . .	(w)	...	1,649	1,583	...	...	111	...	...	...	107	...	...	...	105	...
French Morocco . . . . .	(w)	2,450	(5) 2,477	2,699	98.9	90.8	...	...	...	...	...	...	...	...	e)	...
Tunis . . . . .	(w)	2,100	1,977	1,774	106.2	118.4	120	...	...	...	120	...	...	...	120	...
Total Africa . . . . .		8,129	8,119	8,242	100.3	98.6	...	...	...	...	...	...	...	...	...	...
Grand Totals { (w)		157,336	165,747	157,294	94.9	100.0	...	...	...	...	...	...	...	...	...	...
	(s)	189,673	194,787	181,754	97.4	104.4	...	...	...	...	...	...	...	...	...	...
RYE.																
Germany . . . . .	(w)	11,112	10,610	11,425	104.7	97.3	2.5	—	—	—	2.6	—	—	2.9	—	—
	(s)	...	179	202	...	...	2.8	—	—	—	—	—	—	2.8	—	—
*Austria . . . . .	(w)	...	865	891	...	...	2.5	—	—	—	2.6	—	—	2.8	—	—
	(s)	...	39	51	...	...	2.5	—	—	—	2.4	—	—	2.6	—	—
Belgium . . . . .	(w)	573	553	568	103.6	100.9	...	...	...	...	...	...	...	...	95	...
Bulgaria . . . . .	(w)	598	597	521	100.1	114.7	180	...	...	...	130	...	...	145	...	...
Spain . . . . .	(w)	1,499	1,516	1,658	96.9	88.6	e)	...	...	...	...	...	...	...	...	...
*Estonia . . . . .	(w)	...	356	351	...	...	...	...	...	...	104	...	...	...	...	94
Finland . . . . .	(w)	544	566	551	99.0	98.7	e)	...	...	...	...	...	...	...	...	...
France . . . . .	(w)	1,781	1,744	1,889	102.1	93.8	...	...	...	...	...	...	72	...	...	...

COUNTRIES	AREA SOWN					CROP CONDITION (†)									
	1931-32	1930-31	Average 1925-26 to 1929-30	% 1931-32		I-VI-1932			I-V-1932			I-VI-1931			
				1930-31 = 100	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)	
															Thousand acres
*Latvia . . . . .	...	572	628	...	...	120	—	—	—	—	—	—	—	—	75
Lithuania . . . . .	1,229	1,249	1,159	98.4	106.1	3.7	—	—	3.4	—	—	—	—	—	2.6
Luxemburg . . . . .	17	16	18	108.1	97.1	2.1	—	—	2.3	—	—	—	2.9	—	—
*Netherlands . . . . .	...	445	485	...	...	72	...	...	72	...	...	...	...	...	65
Poland . . . . .	(w) 13,774	14,201	13,996	97.0	98.4	...	...	...	...	(x) 8.0	...	...	...	(x) 8.0	...
(s) 82	82	82	82	...	...	...	...	...	...	...	...	(x) 2.9	e)	...	(x) 2.9
*Rumania . . . . .	(w) 886	802	—	85.4	—	...	...	...	...	...	...	...	...	...	...
*Sweden . . . . .	...	494	662	...	...	3.4	...	...	...	...	...	...	...	...	...
Switzerland . . . . .	(w) 46	46	48	100.0	95.5	...	...	97	...	...	...	97	...	...	92
Czechoslovakia . . . . .	(w) 2,448	2,417	2,482	101.3	98.6	...	...	...	2.6	...	...	...	...	...	3.4
(s) 70	70	78	66	97.0	106.4	...	...	...	...	...	...	...	...	...	...
Yugoslavia . . . . .	(w) 509	522	460	97.5	110.6	...	...	...	...	...	...	...	...	...	...
U. S. S. R. . . . .	(w) 64,765	69,353 (2)	69,227	93.4	93.6	...	...	...	...	...	...	...	...	...	...
Total Europe { (m)	34,170	34,112	34,851	100.2	98.1	...	...	...	...	...	...	...	...	...	...
(n)	98,935	103,465	104,078	95.6	95.1	...	...	...	...	...	...	...	...	...	...
Canada (3) . . . . .	(w) 498	599	705	83.2	70.7	...	...	86	...	...	...	94	...	...	72
(s) 164	164	179	251	91.6	65.4	...	...	95	...	...	...	...	...	...	86
United States (3) . . . . .	(w) 3,281	3,143	3,312	104.4	99.1	...	...	80.4	...	...	...	83.2	...	...	74.8
Total America . . . . .	2,943	3,921	4,268	100.6	92.5	...	...	...	...	...	...	...	...	...	...
Algeria . . . . .	5	3	4	161.1	147.3	...	100	...	...	...	...	...	...	100	...
French Morocco . . . . .	2	2	2	94.5	105.3	...	...	...	...	...	...	...	...	...	75
Grand Total . . . . .	(m) 38,120	38,038	39,125	100.2	97.5	...	...	...	...	...	...	...	...	...	...
(n)	102,885	107,391	108,352	95.8	95.0	...	...	...	...	...	...	...	...	...	...
BARLEY.															
Germany . . . . .	(w) 583	581	444	103.9	131.4	2.8	...	...	2.8	...	...	...	2.8	...	...
(s) 3,440	3,440	3,295	...	...	2.5	...	...	...	...	...	...	...	2.5	...	...
*Austria . . . . .	(w) 18	23	...	...	2.7	...	...	...	2.8	...	...	...	2.5	...	...
(s) 404	404	364	...	...	2.8	...	...	...	2.4	...	...	...	2.8	...	...
Belgium . . . . .	(w) 78	70	73	111.2	106.6	...	...	...	...	...	...	...	...	...	95
Bulgaria . . . . .	805	607	591	99.7	102.5	120	...	...	120	...	...	145	...	...	...
Spain . . . . .	4,558	4,644	4,481	98.0	101.6	a)	...	...	...	...	...	...	...	...	...
France . . . . .	(w) 414	423	408	97.8	101.5	...	...	...	...	...	...	68	...	...	...
(s) 1,445	1,445	1,490	1,313	96.9	110.0	...	...	...	...	...	...	87	...	...	...
*Lithuania . . . . .	...	474	499	...	...	3.5	...	...	...	...	...	...	3.5	...	...
Luxemburg . . . . .	10	11	9	89.9	114.1	2.3	...	...	2.4	...	...	...	2.3	...	...
Malta (5) . . . . .	6	7	7	90.3	94.0	...	...	...	...	...	...	...	...	...	...
Poland . . . . .	(w) 125	128	175	97.9	71.7	...	...	...	...	(x) 3.0	...	...	...	...	...
(s) 3,031	3,031	2,730	...	...	...	...	...	...	...	(x) 3.2	...	...	(x) 3.2	...	...
Rumania . . . . .	2,965	4,742	4,494	62.5	66.0	...	...	...	...	...	...	...	...	f)	...
Switzerland . . . . .	18	18	16	100.0	110.0	...	...	...	95	...	...	98	...	...	98
Czechoslovakia . . . . .	(w) 16	16	15	99.1	108.2	...	...	...	...	...	...	...	...	...	...
(s) 1,699	1,699	1,735	1,745	96.3	97.4	...	...	...	2.4	...	...	...	2.7	...	...
Yugoslavia . . . . .	(w) 609	629	572	96.8	106.4	...	...	...	...	...	...	...	...	...	...
U. S. S. R. . . . .	(w) 872	869 (2)	1,015	100.4	85.9	...	...	...	...	...	...	...	...	...	...
Total Europe { (m)	13,126	15,111	14,543	86.9	91.5	...	...	...	...	...	...	...	...	...	...
(n)	13,998	15,930	15,358	87.6	91.1	...	...	...	...	...	...	...	...	...	...
Canada (3) . . . . .	3,688	3,768	4,704	97.9	78.4	...	...	93	...	...	...	...	...	...	85
*United States . . . . .	...	11,471	11,231	...	...	...	...	82.3	...	...	...	...	...	...	77.2
*Japan . . . . .	...	2,105	2,265	...	...	...	f)	...	...	f)	...	...	...	f) g)	...
Syria and Lebanon . . . . .	810	941	746	86.0	108.6	...	...	80	102	...	...	...	...	...	...
Algeria . . . . .	3,131	3,178	3,505	98.5	89.3	...	100	...	...	...	...	85	...	...	75
Cyrenaica . . . . .	47	32	99	57.7	47.5	...	...	...	...	...	...	...	...	...	66
*Egypt . . . . .	...	306	364	...	...	109	...	...	105	...	...	105	...	...	...
French Morocco . . . . .	2,930	3,222	2,995	90.9	97.8	...	...	...	...	...	...	...	...	...	...
Tunis . . . . .	1,483	1,223	1,235	121.2	120.1	120	...	...	...	...	...	...	...	...	75
Total Africa . . . . .	7,591	7,705	7,534	98.5	96.9	...	...	...	...	...	...	...	...	...	...
Grand Total . . . . .	(m) 25,215	27,525	27,621	91.6	91.3	...	...	...	...	...	...	...	...	...	...
(n)	26,067	28,394	28,642	91.9	91.1	...	...	...	...	...	...	...	...	...	...



COUNTRIES	AREA SOWN					CROP CONDITION (†)									
	1931-32	1930-31	Average 1925-26 to 1929-30	% 1931-32		I-VI-1932			I-V-1932			I-VI-1931			
				1930-31 = 100	Aver. = 100										
Thousand acres															
OATS.															
Germany . . . . .	...	8,310	8,638	...	...	2.7	—	—	—	—	—	—	2.7	—	—
Austria . . . . .	...	720	759	...	...	2.3	—	—	2.5	—	—	—	2.7	—	—
Bulgaria . . . . .	304	295	335	102.9	90.6	130	—	—	130	—	—	—	140	—	—
Spain . . . . .	1,826	1,986	1,902	91.9	96.0	e)	—	—	—	—	—	—	—	—	—
France . . . . .	2,123	2,174	2,021	97.7	105.1	—	—	—	—	—	66	—	—	—	—
France . . . . .	6,295	6,456	6,563	97.5	95.9	—	—	—	—	—	69	—	—	—	—
Lithuania . . . . .	...	900	828	...	...	8.4	—	—	—	—	—	—	3.5	—	—
Luxemburg . . . . .	74	75	72	98.9	102.0	2.3	—	—	2.4	—	—	—	2.2	—	—
Poland . . . . .	...	5,367	5,125	...	...	(x) 3.4	—	—	(x) 3.2	—	—	—	(3) 3.2	—	—
Switzerland . . . . .	...	45	50	...	...	—	—	98	—	—	98	—	—	—	97
Czechoslovakia . . . . .	2,027	2,042	2,081	99.3	97.4	2.7	—	—	2.6	—	—	—	2.7	—	—
—															
Canada (3) . . . . .	12,905	12,871	12,971	100.3	99.5	—	—	95	—	—	—	—	—	—	88
United States . . . . .	...	39,772	40,280	...	...	—	—	78.9	—	—	—	—	84.7	—	—
Syria and Lebanon . . . . .	27	27	42	99.5	64.8	—	100	—	—	100	—	—	—	—	—
—															
Algeria . . . . .	497	557	605	89.1	82.2	—	100	—	—	—	85	—	—	—	75
French Morocco . . . . .	63	60	82	106.0	77.2	—	—	—	—	—	—	—	—	—	—
Tunis . . . . .	74	72	109	108.4	67.9	120	—	—	—	—	—	—	—	—	75

\* Countries not included in the totals. — a) above the average. — b) average. — c) below the average. — d) very good. — e) good. — f) average. — g) bad. — h) winter crop. — i) spring crop. — m) Not including the U. S. S. R. — n) Including the U. S. S. R. — (†) See explanation according to the various systems, page 367 — (x) Towards the middle of the month. — (2) Average 1928-29 and 1929-30. — (3) The figure for 1931-32 is that of the area expected to be harvested; the areas for preceding years are those actually harvested. — (4) 2nd estimate of production of 1931-32: 204,557,000 centals (340,928,000 bushels) against 207,178,000 (345,296,000 in 1930-31 and 199,091,000 (331,819,000), the average of the five years ending 1929-30; percentages: 98.7 and 102.7. — (5) The area sown as estimated in spring 1931 was 10% greater than that finally estimated (2,719,000 acres). — (6) Including meslin.

able. At the beginning of June some cases of chlorosis and rust were reported and the persistent bad weather threatened to cause their spreading. In the regions of the Centre conditions are not very good, but at the middle of June the wheat was only just beginning to flower and an improvement was still possible. In the West, the Paris Basin and the North and East, the production of which is larger than that of the remainder of France, crop condition on 1 May was better than at the same date of last year but since this date the continued bad weather has brought about a change: due to the too vigorous growth there is a danger of lodging, rust is a menace in many districts and the lack of warmth and sunshine is not favourable for flowering and the development of grain. It should, moreover, be noted that, if the autumn rains increase yields, a mild, wet winter followed by an abnormally wet spring in general results in poor production. Up to 10 June normal seasonal conditions did not exist anywhere, except for a brief period of warmth and fine weather towards the middle of May; in the second week of June violent storms burst at many points, especially in the Southwest.

It seems, therefore, that despite the good or fairly good appearance of the crops, hopes cannot be entertained this year for wheat either of average yields or in general, of very good quality.

As regards the oat crop, which is infested with weeds, the situation is still less good and the same may be said of barley whereas rye seems to have better resisted.

*Great Britain and Northern Ireland* : In England and Wales, with the exception of a few fine days in the middle of the month, the weather during May was cold with considerable rain and some night frosts. In Scotland similar conditions prevailed in the first three weeks of the month. Conditions generally were unfavourable to agriculture, retarding growth and field operations and encouraging weeds; floods were reported in some districts. Spring-sown cereals germinated slowly and were backward. With the exception, however, of crops on heavy or waterlogged land, which were thin and patchy and showed loss of colour, cereal crops at the end of the month on the whole were not unpromising. The wheat area in England and Wales is estimated to be somewhat larger than in 1931 whereas slight reductions are reported for barley and oats.

In Northern Ireland autumn-sown wheat made very good progress in May and the brairds on the whole were looking well. Spring-sown wheat was affected to some extent by the unfavourable weather which prevailed during the early part of May and for some time previously but with the advent of more favourable conditions a district improvement took place. The 1932 oat crop has brairded well in most districts; locally cases of damage by frost or insects, and patchiness are reported. The barley crop was making satisfactory progress but the area sown was of small dimensions.

*Greece* : Despite some damage by scorching winds (livas) and hail during the first half of May frequent rains throughout practically the whole of the country were very favourable to cereals, production of which promised to be very satisfactory and much superior to that of last year.

According to the Ministry of Agriculture the cereal crop in 1932 is very good. The first estimate for this year compared with the final estimates for 1931 and the average of 1926 to 1930 is as follows :

		1932	1931	Average 1926-30	% 1932 = 100	Av. = 100
		—	—	—	—	—
Wheat . . . . .	(000 centals)	11,023	7,152	7,323	150.5	154.1
	(000 bushels)	18,372	12,205	11,920		
Rye . . . . .	(000 centals)	882	1,017	898	86.7	98.2
	(000 bushels)	1,575	1,816	1,603		
Barley . . . . .	(000 centals)	5,291	4,391	3,333	120.5	98.7
	(000 bushels)	11,023	9,147	6,945		
Oats . . . . .	(000 centals)	2,205	2,073	1,595	106.4	138.2
	(000 bushels)	6,889	6,477	4,985		

On the basis of these figures the average yield per acre this year is expected to be very high for all cereals. The abundant wheat crop makes a considerable reduction in imports in the coming season probable.

*Hungary* : In the two weeks from 24 May to 8 June the weather was characterised by variable temperatures, by sporadic but violent storms and hail and, in most of the country, by abundant rainfall. At the end of May the maximum day temperature reached 28°C and, in the first week of June, 30°C. Night temperatures fluctuated round 15°C and at the end of May, touched 8°C. Damage by hail and parasites are reported only sporadically. The wheat crop has improved after the rains but is generally short and thin. The ears are short and only partly filled and, in places, empty. Production is

forecast to be only slightly below the average. The rye crop has already flowered ; the ears are short and only partly filled. Production is forecast to be only slightly above the average as is also that of barley and oats.

*Italy* : In May wheat growth was promising despite partial laying and some slight rust attacks. The continuance of low temperatures throughout the spring caused a general retardation of growth ; in the latter half of the month, however, harvesting of early varieties began in the Islands and in some provinces of the South. At the end of May condition of the minor cereals was fair ; in the South harvesting of oats was beginning

*Latvia* : May was a very warm month with temperatures 1.5° to 2°C above the normal. During the first ten days of the month temperatures were only slightly above the normal. During the second week of the month the weather was cool (some snow fell on 11 May) ; after 14 May temperatures began to rise and remained at a higher level until the end of the month except on 28 and 29 May. Most of the precipitation was recorded during the first half of the month. During the last few days of May precipitation was sufficient. The weather conditions in general in May were favourable, hastening the growth of cereals. According to correspondents' reports crop condition of winter wheat on 1 June was average in 44.9 % of the cases, above the average in 43.6 % and below it in 11.5 % ; corresponding figures for rye are : 38.9 %, 55.5 % and 5.6 %.

*Lithuania* : Weather conditions in May favoured field work and the growth of cereals.

*Luxemburg* : The weather conditions during May generally favoured the growth of crops.

*Malta* : Wheat production in 1932 is estimated at 181,000 centals (301,000 bushels) as against 166,000 (277,000) in 1931 and 179,000 (298,000), the average for the quinquennium 1926-30. Percentages : 108.6 and 101.0. Corresponding figures for barley (including meslin) : 129,000 (269,000) ; 137,000 (285,000) ; 141,000 (294,000) ; 94.4 and 91.8.

*Norway* : The winter was mild with little snow. In the east and south spring was earlier and in the west and north later than usual. Weather remained rather cold up to mid-May ; subsequently higher temperatures favoured growth and rains were sufficient. Preparations for spring crops were made rapidly under good conditions and were almost completed at the end of May. At the beginning of June the condition of all crops was good.

*Poland* : In the second half of May and the first half of June weather was favourable and on 5 June crop condition showed an improvement on that of 15 May. On the whole the condition of cereals was above the average and on 5 June slightly above that on the corresponding date last year.

Crop condition of wheat and rye from 15 April to 15 May deteriorated slightly owing to insufficiency of rain in the second half of April and first decade of May. The frosts in the second half of April had also an unfavourable effect on winter sowings. Some part of the deterioration is also attributed to the diminution in the use of nitro-

genous manures. Toward the end of May the quantity of rain that fell was considered sufficient by 53 % of the correspondents, abundant by 10 % and insufficient by 37 %. The soil saturation also varied considerably. Insolation and temperatures were sufficient for growth. The majority of correspondents (81 %) intimated that growth of cereals is backward this year; normal growth was reported by only 18 %. Delayed field operations were reported by 73 % of the correspondents; sowings of spring cereals were, however, effected under favourable conditions and at first under excellent conditions.

*Rumania*: In the latter half of May weather conditions were generally favourable to the crops, temperature remaining at a level favourable to growth and rainfall being sufficient. At the beginning of June rain was needed only in a few regions of southern Bessarabia, the plateau area of Transylvania and the Danube valley.

Crop condition of winter cereals is mediocre throughout the country except in Oltenia, Bukovina, northern Bessarabia and five departments of Transylvania. The principal causes of this somewhat unsatisfactory condition were: delayed sowing in the autumn of 1931, the long winter, floods and cold weather during the spring of this year. Winter wheat has suffered relatively less than barley and oats, losses of which in each case amounted to 35-50 %.

The spring cereal sowings were finished at the end of May with a delay of 20-40 days. In most departments the areas under spring cereals are larger or at least equal to the respective areas of last year.

In April and at the beginning of May the spring sowings progressed slowly. In various regions their aspect was not altogether satisfactory and the straw was short. Favourable weather in the last ten days of May greatly helped to improve them.

Scattered hailstorms in most districts in the latter half of May caused some damage only in three departments of Transylvania and in one of the Old Kingdom.

*Switzerland*: Growth of the crops, after having been checked during the whole of the beginning of spring, recovered well in May. During the first half of the month the plants made only poor progress in growth due to the persistence cold weather. In contrast, towards the middle of the month almost summer temperatures gave a great impetus to growth and arrears were largely made up. The winter wheat and spelt crops particularly have improved since the previous month. There are thin or bare patches in places, however, as a result of late sowing or winter damage. Despite the delay incurred, the summer sowings have grown rapidly under the influence of the rise in temperature and their aspect is good. Crop condition of spelt on 1 June 1932 by the Institute's system was 97 against 94 on 1 May 1932 and 97 on 1 June 1931; that of mixed grain was 97 against 94 and 98 respectively.

*Czechoslovakia*: The area sown to meslin this year is 20,900 acres against 20,750 last year and 26,190 on the average of the five years ending 1930. Percentages: 100.8 and 79.9. For spelt the corresponding figures are as follows: 1,560, 1,540 and 660; 101.6 % and 235.8 %.

*Yugoslavia*: The weather in May was at first rainy and cool and then rainy and warm, favouring the growth of cereals in general. Spring cereal sowings were effected under good conditions towards the middle of the month and at the beginning of June had sprouted well. Weather conditions, especially in the latter half of the month, were very favourable to winter cereals which, improved after the damage caused in

April. On the basis of the crop condition of cereals at the beginning of June an abundant crop was forecast.

U. S. S. R. : According to the agricultural section of the Meteorological Office of the Commissariat for Agriculture crop condition of winter cereals at the beginning of the third decade of May was wholly satisfactory throughout the country. Winter sowings were in particularly good condition in many districts of the Lower Volga, Nizhni Novgorod, the Tatar Republic, Bashkiria and in all the eastern part of Crimea. On the other hand in some districts in the western zones crop condition of winter cereals was below average; given the relatively limited number and area of these districts, however, crop condition of winter cereals may on the whole be considered satisfactory and to have a tendency to rapid improvement. For example in some districts of Ukraina in which the wheat situation was rather unsatisfactory there was considerable amelioration in the last decade.

In the southern districts winter rye reached the earing stage in the second decade of May and almost everywhere in the others the shooting stage. A satisfactory crop condition was predominant and only in the western district were losses due to the winter weather conditions (the formation of an ice layer) reported. Winter wheat was almost everywhere at the shooting stage. In the third decade of May there were moderate and sometimes abundant rains in the Lower and Middle Volga, the Urals, the Central Black Earth Region and Northern Caucasus. In Ukraina the rains were less frequent and less plentiful.

As regards spring cereals the areas sown are indicated in the following table, at intervals of five days from 1 May for the years 1932, 1931 and 1930.

*Area of spring cereals*  
(millions acres).

Area sown	Spring wheat			Spring barley		Spring oats		Spring barley and oats		
	1932	1931	1930	1932	1931	1932	1931	1932	1931	1930
1 st May . . . . .	15,3	16,1	29,4	7,2	8,9	4,2	4,4	11,4	13,3	23,5
5   "   . . . . .	23,0	25,7	30,4	8,1	13,3	6,7	8,9	14,8	22,2	29,9
10   "   . . . . .	32,6	31,9	31,4	9,6	9,9	9,7	14,3	19,3	24,2	34,1
15   "   . . . . .	41,5	37,8	35,6	11,1	11,1	15,1	19,0	26,2	30,1	38,4
20   "   . . . . .	44,2	43,7	37,3	12,1	12,1	20,0	23,7	32,1	35,8	35,1
25   "   . . . . .	47,9	49,2	38,8	12,8	12,8	24,2	27,7	37,0	40,5	37,1
1   June . . . . .	50,9	54,6	47,7	13,9	13,1	27,9	32,1	41,8	45,2	48,9
5   "   . . . . .	52,1	59,6	50,4	14,3	14,1	31,1	36,3	45,5	50,4	50,7
10   "   . . . . .	52,9	60,5	54,9	14,8	15,1	33,1	38,3	47,9	53,4	55,6
Area sown	...	63,0	57,1	...	16,1	...	42,5	...	58,6	59,1

It will be seen from the table that on 1 May 1932 the area sown was slightly smaller than in 1931 and very much smaller than in 1930 owing to the considerable delay in the commencement of sowings in 1932, as in 1931, through weather conditions. In the first two decades of May sowings were actively carried out so that by 20 May the areas under wheat and barley had attained those of 1931 while that under oats remained below that of 1931. In the succeeding period the rate of sowings slackened and on 10 June the area under wheat and oats was considerably less than last year while that under barley was the same. On 10 June wheat and oats sowings in the southern and south-eastern regions were practically at an end while in the other regions they might, as

last year, be continued until the end of June. It is not likely that the areas under wheat and oats can attain those of 1931.

For wheat the situation on 5 June 1932 was as follows, compared with the total in the principal regions in 1932.

*Area in million acres.*

	On 5 June 1932	1931	Total sown in 1931
Western Siberia . . . . .	8.6	9.4	10.6
Eastern Siberia . . . . .	1.2	1.0	1.5
Lower Volga . . . . .	7.4	7.7	9.1
Middle Volga . . . . .	6.9	7.4	7.7
Kazakstan . . . . .	4.7	6.7	7.7
Ukraine. . . . .	3.0	5.7	6.9
Ural region . . . . .	5.2	6.4	6.4
Northern Caucasus . . . . .	5.2	5.2	5.2
Bashkiria . . . . .	2.5	2.2	2.5

As may be seen from these figures the decrease has been most marked in Ukraine, Kazakstan and the Ural region. Between 5 and 10 June the situation in the above-mentioned regions did not change, given that in the period only 740,000 acres were sown to wheat in the whole country.

The total area sown to spring crops up to 10 June in the current year represents 85.7 % of the plan against 89.6 % on the corresponding date last year and is about 4.7 million acres below that of the preceding year.

By 10 June the *sovkhozi* had put into effect 96.0 % of the plan for all spring crops, the *kolkhozi* 89.6 % and individualistic holdings 68.6 %.

In the first half of June there were rains of varying intensity, generally moderate and distributed over a large area; however, given the persistence of rather high temperatures in the more southern regions of the country, there are complaints in some areas (south-eastern Ukraine, Lower Volga and Kazakstan) of insufficient precipitation.

*Argentina* : The weather during May was generally favourable to the cereal sowings and their germination. Towards the end of the month some complaints were made of drought in the Provinces of Buenos Aires and Santa Fé. In the Province of Cordoba, on the contrary, weather conditions were particularly favourable and germination varied from good to excellent whereas in the Province of Santa Fé the flooding of the Paraná caused some damage. It is confirmed that the area sown to wheat this year will be 10 % larger than last year, that is an increase of approximately 1,700,000 acres.

*Canada* : A summary of wheat conditions in Canada up to about May 23 published by the Government at Ottawa is as follows :

" The early spring season of 1932 in the Prairie Provinces promised a somewhat mitigated recurrence of the moisture conditions of the past three years. Across the northern park-belt and along the foothills winter precipitation had been ample and topsoil moisture was considered quite sufficient. In the main wheat area running along the

southern border, the fall and winter precipitation had been greater than in the previous few years, but still subnormal and insufficient. During the first three weeks of April, the weather was generally fair and warm and there was a notable loss of soil moisture. In southern Alberta, there was some drifting. Seeding and land work began early but were interrupted at the beginning of the fourth week of April by heavy and general precipitations. The unsettled weather lasted for four or five days and made the season later than usual. In southern Saskatchewan further rains fell in the first week of May. Seeding was delayed greatly in eastern Manitoba and northern and western Alberta but two to three weeks of fair weather in May enabled the bulk of the wheat drilling to be completed. The high temperatures prevailing and some high winds resulted in a rapid desiccation of the topsoil during May and, since subsoil moisture was distinctly limited in the central wheat area, rain was soon needed. A dust storm blew over large areas of Saskatchewan on the 13th and 14th but was ended by light rains. Germination was strong and even, although it is probable that there will be a considerable variation in dates of maturity due to seeding before and after the storm of late April. Generally speaking, seeding of wheat was two weeks later than in 1931.

Heavy rains fell between Prince Albert, Saskatchewan and Coronation, Alberta in the week of the 16th and scattered showers fell in southern areas on the 19th and 20th, but May precipitation was distinctly limited and the reserves from the fall, winter and spring period had been diminished in the wheat belt until the 22nd and 23rd, when heavy and general rains similar to those of the same period in April covered the entire West. As in 1929, 1930 and 1931 the crop is dependent upon regular, well distributed and heavy rainfall during the growing season. In the northern and western park areas and from the Red River Valley eastward, the crop prospects are much better. Alberta is again in the most promising position from the standpoint of moisture reserves, but conditions in the other provinces are the best since 1928.

The Canadian Government cabled on 31 May that conditions of spring wheat ranged from good in Manitoba and Saskatchewan to excellent in Alberta. There was, however, increasing realisation that moisture reserves were low and growing concern over probabilities of cutworm and grasshopper damage. Frost and drifting had already caused some irreparable damage in Manitoba and Saskatchewan. Cutworms were working over wide areas in Saskatchewan and Southern Alberta and grasshopper damage was feared in Manitoba and Saskatchewan. Rain was needed in Manitoba and Saskatchewan, while warm weather would have been more welcome to quicken growth in Alberta. Wheat seeding had been completed and drilling of coarse grains was well advanced.

On 1 June all cereal crops were in much better condition than at the corresponding date of last year. In the Maritime and Eastern Provinces condition of all cereals except winter wheat in Ontario is below that of 1931. In the Prairie Provinces and British Columbia cereals have a much better appearance than last year's crop at the same date. Practically the entire wheat area of Alberta has prospects above the average; in Manitoba the crop is extremely uniform, while that of Saskatchewan promises much better returns than in 1931. During the first nine days of June the weather throughout Canada was more favourable to the growth of crops, warmer temperatures and good rains having been general.

During the week ended on 7 June the condition of wheat crops was markedly improved in the most important producing areas owing to the fall of good rains which were particularly abundant (2 inches) in south-central Saskatchewan and central Alberta; the Calgary area (southern Alberta) had 3.5 inches and the rivers were reported to be in flood. In some districts of Saskatchewan and Alberta cutworms and wireworms caused marked damage, while in Manitoba grasshoppers were hatching in great num-

bers. In contrast to this news, plant pathologists reported that the wheat roots were particularly healthy. Temperatures varied considerably during the week, with light frosts in the Peace River country. Prospects were excellent in Alberta and good in Manitoba and Saskatchewan.

According to a later cable of 14 June crop conditions vary greatly in Canada. Seeding and growth are generally backward, particularly in the Maritime Provinces, Quebec and Eastern Ontario. Recent weather has, however, been more favourable. Winter wheat in Ontario maintains high promise. Grain crops further improved in the past week in the Prairie Provinces except in southeastern and northern Manitoba where the drought is now dangerous. Southwestern Manitoba and southern Saskatchewan received heavy rains in the past week which greatly improved the conditions for wheat. In Alberta soil and weather conditions are almost ideal. Grasshoppers and cutworms are still a menace and are causing some damage.

The area sown to mixed grains is estimated at 1,198,000 acres or about the same as last year's area of 1,187,000 acres but 11.2 % above the five-year average (1,077,000 acres); crop condition on 1 June was 95 against 99 at the same date of last year.

The latest news from Canada received by cable of 21 June is as follows: "With the necessary reservations because of the presence of insect pests in dangerous numbers and because of the absence of reserve moisture over wide areas, western grain prospects still promise average yields per acre. Warm weather during the past week has stimulated the growth of all crops. Wheat is in the shot blade stage with the earlier fields earing. Heavy rains have fallen in northern and eastern Manitoba, northern Saskatchewan and southern Alberta but the remaining and most important areas of the wheat belt have received very light precipitation. The first hailstorms in Manitoba and Alberta have caused no serious damage. The grasshopper pest has become serious in Manitoba; the insects are now migratory and control has become more difficult. Cutworm damage is light but general.

*United States* : According to information cabled by the Department of Agriculture on May 26, rainfall was unsatisfactory in the western and central sections of the winter wheat belt but in the eastern section crop condition was good. Crop condition of spring wheat was fairly good. In the week ended on 2 June the drought area had extended in more districts of the Ohio Valley, with rains still needed in most parts; progress and condition varied from poor to very good, being good in eastern and southern sections. In the central-western winter wheat belt, notably in Missouri and Nebraska, timely rains were of much benefit but wheat was reported short in the latter State. Western Kansas continued dry and condition varied from very poor to poor whereas wheat had nearly all headed in the eastern two thirds of the State. Oklahoma needed rains and condition was very irregular, varying from poor to very good. In the Northwest, cool weather checked growth in the northern section but condition remained satisfactory. Harvesting of winter wheat continued in the Southeast and wheat had eared as far north as Pennsylvania. In the spring wheat region, mostly favourable advance and condition were noted although there was some slight frost injury locally. Oats ranged from poor to fair in the Southwest with harvest begun as far as southern Oklahoma; condition ranged from fair to good in most sections of the country. In the subsequent week ended on 9 June nearly general rainfall improved cereal crops; harvesting was in progress in the western Gulf States. The condition of spring wheat varied from good to excellent.

On 16 June the condition of grain crops had changed little since the report of a week previously.

Production of rye this year is estimated at 21,672,000 centals (38,700,000 bush-



els) against 18,338,000 (32,746,000) last year and 22,692,000 (40,522,000), the average of 1925-26 to 1929-30; percentages: 118.2 and 95.5

For wheat production see table on page 368.

According to a later telegram of June 23, harvesting of winter wheat was in full swing in Kansas and threshing was in progress in the Southwest. The crop condition of spring wheat was good; earing had begun.

*Mexico* : Frosts in the first half of April seriously damaged crops in the principal producing centres. According to the preliminary official estimate, production this year is definitely deficient due to the considerable reduction in area sown. Production this year is, in fact, estimated at 5,438,000 centals (9,064,000 bushels) against 9,736,000 (16,226,000) last year and 6,724,000 (11,207,000) on the average for the preceding five years; percentages: 55.9 and 80.9.

*India* : On May 26 the condition of the wheat crop in India as a whole was fairly good.

*Palestine* : Abnormally cool weather, with heavy dew fall, continued during May, and enabled late-sown winter crops, such as wheat and the late maturing varieties of barley, to reach maturity. Large areas, which in normal years would have proved a complete failure, will, thanks to favourable climatic conditions, now show some return. In Southern Palestine the total yield of all winter crops is now estimated to be from 40% to 50 % of normal. However, it is gratifying to note that almost throughout the country selected wheats and barleys, distributed from the Acre Stud Farm, show a far better stand, and give promise of higher yields than the surrounding crops grown from local seed. Detailed inspections of the crops in Northern Palestine make it almost impossible to generalise, but in the plains of the western and northern areas it may be assumed that the crop will be better than expected. Harvesting of wheat is in full swing. Harvesting of barley has been completed almost throughout the country. Crop condition of both crops on 1 June was poor. Prices of cereals have dropped and show a further tendency to decrease. Wheat was quoted at from £P 10 to £P 11 per metric ton during May, as against £P 11.750 to £P 12.500 in April. Barley has dropped from £P 8.400 to £P 5.600 at the end of May.

*Algeria* : Rainfall at the middle of May, followed in the last week of the month by misty weather and cool, damp nights, came too late to be of much benefit to cereals or to compensate for the long spring drought which was hardly interrupted by the insufficient and badly distributed rains as the end of April. In the west of the colony, in Oran, fairly large areas destroyed by the drought have had to be cut green or grazed. Cutting of barley was in progress almost everywhere when the last rains fell and this cereal could derive no benefit from them; yields are little above the very small ones obtained last year. The same is more or less true for oats and soft wheat, the weight of which was, however, increased. Only hard wheat derived appreciable benefit as the moisture was available before its complete maturity; this cereal is also the only one for which a large increase in production is anticipated of 12.3 % (12,566,000 centals; 20,944,000 bushels forecast compared with 11,187,000 (18,644,000) actually obtained last year.

It should be noted that the first estimates made in the latter half of May are subject to large reductions if a period of prolonged scirocco and great heat sets in during ripening immediately before cutting; this took place last year at the beginning of June and decreases occurred of 15 % for wheat, 13 % for barley and 23 % for oats. This year,

barley, oats and soft wheat, especially barley, have almost reached this state due to their advanced maturity but hard wheat has already been affected.

The fourth estimates of areas sown do not greatly change the previous ones except in the case of rye, the area of which, although still small, seems to be on the increase.

*Egypt* : During May weather has been favourable to maturing and harvesting of wheat. The late crops have completely matured. Harvesting of the crops in Upper Egypt was over at the beginning of June but was still in progress in the general crops in Middle and Lower Egypt. The yield is 11 % above the average. Harvesting of barley was over at the end of May. Threshing, winnowing and storing are in progress. The yield is 9 % above the average.

*French Morocco* : At the end of May, cutting of barley and oats was well advanced ; that of wheat was general in the first week of June. Despite the generally deficient yields on native holdings and serious but very localised damage due to cecydomia, a good average crop is on the whole counted upon.

*Tunis* : Cereals have ripened under good conditions. Although locusts in the South and hail in the Centre have caused some damage, yields promise to be very good ; that of soft wheat should be quite exceptional, with an average of 13.4 centals (22.3 bushels) per acre (2,646,000 centals or 4,409,000 bushels on 198,000 acres) ; the average yields of hard wheat and barley, although not so high, are about equal to those of very good years, approaching 3.6 centals (5.9 bushels) and 4.5 (9.3) per acre respectively.

The areas sown having moreover, been exceptionally large last winter, production of the main cereals, hard wheat, soft wheat and barley, should be the largest so far obtained in Tunis ; the almost constant increase in production of soft wheat is particularly noteworthy. As the first estimates have been made at the beginning of harvest, they apparently will not be subject to great change as a result of eventual weather conditions ; moreover, such changes in past years have, with rare exceptions, generally resulted in a small positive difference of the final estimate over the preliminary estimates so that the actual production of cereals in Tunis should at least equal the present preliminary estimate.

## MAIZE

*Austria* : At the beginning of June the maize crop was relatively short. The first hoeing of early sowings began in places. Crop condition on 1 June was 2.5 against 2.6 on 1 June 1931.

*Bulgaria* : After the gradual diminution of the maize area during the last three years this year's area (1,710,000 acres) slightly exceeds both that of 1931 (1,676,000 acres) and the 1926-1930 average. Despite frequent rains in the first half of May the maize crop still needs more. Crop condition on 1 June however, was 140 (by the Institute's system against 120 at the same period of the previous year.

*France* : The last plantings of maize, tillage and weeding have been hindered by persistent bad weather but on the whole, the situation of planted crops is so far satisfactory. Buckwheat sowings have been effected under bad conditions and are backward with the prospect of a reduction in acreage this year.

## Maize.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931	1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931	1931/32
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Aver. 1930/ 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Average 1930/ 1931 = 100
	1,000 acres					1,000 centals			1,000 bushels of 56 lbs				
Austria . . .	148	148	146	108.9	101.7	3,314	2,663	2,490	5,917	4,766	4,447	124.4	183.1
Bulgaria . . .	1,676	1,689	1,671	99.2	100.3	21,983	17,088	14,718	39,256	30,515	26,274	128.6	149.4
Spain . . .	1,053	1,106	1,057	95.2	99.6	14,778	16,152	13,144	26,389	28,844	23,471	91.5	112.4
France . . .	833	833	848	99.9	98.2	13,246	12,532	9,428	23,654	22,879	16,837	105.7	140.5
Greece . . .	529	546	503	98.3	105.1	3,022	3,809	3,597	5,397	6,302	6,423	79.3	84.0
Hungary . . .	2,720	2,605	2,662	104.4	102.2	33,459	31,021	29,546	59,749	55,894	70,618	107.9	84.6
Italy . . . (s)	3,426	3,490	3,541	98.1	96.7	41,519	62,832	51,754	74,142	112,200	92,418	68.1	80.2
Italy . . . (t)	238	255	218	98.4	109.8	2,266	3,003	2,018	4,040	5,362	5,585	78.5	112.6
Poland . . .	243	233	217	104.2	111.6	2,296	1,847	1,940	4,099	3,299	3,464	124.3	118.3
*Portugal . . .	865	868	827	99.6	104.6	...	9,364	7,950	...	16,722	14,196	...	...
Rumania . . .	11,749	10,989	10,606	107.4	110.8	133,418	99,648	99,979	247,175	177,942	178,534	138.9	138.4
Switzerland . .	3	3	3	79.2	76.4	64	64	84	114	150	100.0	75.9	...
Czechoslovak . .	344	360	343	95.8	100.5	5,020	5,479	5,363	8,965	9,783	9,577	91.6	93.6
Yugoslavia . . .	5,901	5,926	5,180	99.6	113.9	70,623	76,381	67,356	126,113	136,395	120,279	92.5	104.9
Total Europe . .	28,863	28,128	26,995	102.6	106.9	350,008	332,519	311,407	625,016	593,785	556,087	105.3	112.4
*U. S. S. R. . .	9,801	9,684	8,836	101.2	116.9	...	...	79,114	...	...	141,275	...	...
Canada . . .	131	161	174	81.2	75.2	3,039	3,263	3,708	5,426	5,826	6,613	93.1	82.1
United States . .	104,970	100,743	99,560	104.2	105.4	1,431,843	1,163,704	1,587,197	2,556,863	2,060,185	2,745,001	124.1	93.1
Mexico . . .	7,939	7,599	7,709	104.5	103.0	42,589	30,353	44,001	75,962	54,201	78,574	140.1	96.7
*Tot. N. Amer. . .	113,040	108,503	107,443	104.2	106.2	1,477,421	1,187,320	1,584,901	2,638,251	2,120,212	2,823,188	124.4	93.2
Corea . . .	267	263	251	101.4	106.5	1,765	1,885	1,676	3,152	3,366	2,993	93.8	105.3
Manchuria . . .	2,441	2,139	2,489	114.1	98.9	37,754	35,030	37,848	67,413	62,554	67,586	107.8	99.8
Syria and Leb. . .	67	61	121	109.7	55.2	770	600	1,370	1,376	1,071	2,446	128.5	56.2
Algeria . . .	24	24	25	99.2	97.0	133	164	144	238	292	257	81.3	92.7
Eritrea . . .	22	22	13	100.0	166.7	132	198	79	236	354	142	66.7	166.7
Kenya (1) . . .	196	206	201	94.9	97.6	1,922	3,299	2,475	3,432	5,892	4,420	53.3	77.7
Fr. Morocco . .	864	649	661	133.1	154.1	2,932	3,335	2,973	5,326	5,954	5,309	89.4	100.3
It. Somaliland . .	28	40	39	70.6	72.9	301	530	426	537	946	760	56.8	70.7
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	108	197	236	192	83.3	102.5
Total Africa . .	1,178	978	834	120.3	133.6	5,530	7,658	6,205	9,966	13,674	11,780	72.9	89.9
Argentina . . .	14,468	13,776	11,549	105.0	125.3	150,246	231,707	165,215	268,296	413,763	295,028	64.3	90.9
*Chili . . .	89	92	88	96.7	101.0	...	1,516	1,229	...	2,707	2,194	...	...
Madagascar . .	227	229	207	99.2	110.0	2,023	1,623	2,302	3,622	2,898	4,111	125.0	88.1
Un. of S. Afr. . .	5,732	5,370	5,143	106.7	111.3	33,333	32,016	35,776	59,532	57,171	63,885	104.1	93.2
Grand Total . . .	166,283	159,447	155,067	104.3	107.3	2,053,910	1,830,358	2,146,700	3,676,639	3,268,494	3,833,404	112.5	95.9

\* Countries not included in the totals. — s) Late crop («maggengo»). — t) Early crop («cinquantino»). — (1) European crop. — (2) Maize and sorghum.

*Hungary*: The maize crop grew more rapidly after the rains. On about 10 June weeding was in progress.

*Italy*: The last sowings were completed in the first half of May; in the second half of the month hoeing was begun, growth being good.

*U. S. S. R.*: The area of maize sown on 10 June was 8,799,000 acres, 79.2 % of the Government plan.

*United States*: According to a cable of 26 May from the Department of Agriculture, planting had been almost finished in the maize belt. In the week ended on 2 June

warmer weather was needed east of the Mississippi River and rain was required in many places, especially in the eastern Ohio Valley. In Ohio germination and sowing were retarded by the dry weather and in Kentucky the early crop had a poor colour. In the western part of the belt the week was mostly favourable though higher temperatures would have been better for growth. Planting had been about completed rather generally. Rain was needed in Oklahoma.

*Mexico* : The dry, cold weather which predominated in April was generally favourable for tillage and the first sowings. During the first ten days of May almost general rains in the principal centres of production encouraged the growth of the cropst

*Algeria* : The rains at the end of April and particularly those at the middle of May were very beneficial to the maize crop, production of which, despite the reduced area, should be the largest obtained in Algeria in the last ten years and also slightly above that of 1930. Area : 21,700 acres reduced by 9.1 % from that of 1931 (23,900 acres) and by 10.6 % from the average of 1926-30 (24,300 acres). Production : 165,000 centals (295,000 bushels) — 24.2 % above that actually obtained in 1931 (133,000 centals ; 238,000 bushels) and 14.8 % above the average for 1926-1930 (144,000 centals ; 257,000 bushels). Crop condition of 1 June was average (100).

*French Morocco* : Maize, like all the spring crops, has a satisfactory appearance.

*Tunis* : According to the first estimate, maize will this year have the same area as in 1931, namely, 44,500 acres ; this area is 8.2 % above the average for the preceding five years (40,200 acres). Crop condition on 1 June was good.

*Union of South Africa* : Except in a few favoured areas, mostly in Transvaal, droughty conditions prevailed in the Union during April but, fortunately, the comparative mildness of the autumn in the inland areas enabled most of the crops to mature. Late planted maize, however, appears to have suffered somewhat from stalk-borer, particularly in the Northern Free State districts. Although good rains fell over the Springbok Flats, they were of little immediate benefit. The general droughty conditions at the close of the season are responsible for the fall in the latest estimate. On the other hand, the absence of serious frosts has resulted in an improvement in the estimates for some areas. Fairly general rains appear to have fallen in May but their volume and extent are as yet unknown.

## RICE

*Bulgaria* : The area planted to rice this year is 15,600 acres against 14,300 in 1931 and 18,300 on the average for 1926-1930 ; percentages : 109.0 and 84.9. Weather conditions during May were not altogether favourable for the rice crop, the condition of which was 95 on June 1 (by the Institute's system) against 110 at the same period of last year.

*Italy* : Rice planting has been completed under normal conditions. In May growth was normal although a little backward.

*Brazil* : According to a communication of the " Sindicato Arrozeiro ", of the Rio Grande do Sul State, production in the current season will be much smaller than that of last year. In the State of São Paulo, which generally produces nearly half of the total crop, a reduction of 35 % is anticipated compared with the season 1930-31 when 9,268,000 centals (20,596,000 bushels) were obtained and of 30 % in Rio Grande do Sul which last year produced 4,165,000 centals (9,254,000 bushels). Large reductions are also anticipated in the other producing States.

*United States* : On 2 June rice had improved and there was reported to be ample water in Louisiana.

*India* : In Bengal light to moderate rains in the last week of May and the first week of June aided field operations and the sowings in general. Rainfall varied greatly in the latter half of May in Bihar and Orissa being deficient in some areas and light or moderate to heavy in others. Condition on 30 May was good except in Champaran and Bhagalpur. In Madras rainfall was heavy in the latter half of May on the west coast and parts of the central districts.

*Turkey* : Much rice has been planted this year in the vilayets of Tarsus, Cebelibereket and Kadirli of the fourth agricultural region. Activity is noted in the country. Many workmen and reapers have been engaged from all of the neighbouring vilayets to work in the plains of Adana.

*Egypt* : The considerable improvement in Nile conditions has induced the Government to authorize a more than average extension of rice plantations in Lower-Egypt (see Crop Report for April 1932). During May the weather has been favourable to sowing, germination and growth. Preparation of land in the authorized zone is in full swing. The early crops have already been sown. Germination and growth are satisfactory. The Ministry of Public Works permitted rice plantation in the North of Delta from 10 May.

## POTATOES

*Germany* : Early potatoes have sprouted well.

*Austria* : Potatoes have grown slowly. At the beginning of June hoeing of early varieties had begun.

*Belgium* : The last potato plantings have been effected and earthing up of early varieties has begun. Tillage has commenced but wet, cold weather has been unfavourable for the destruction of weeds.

*France* : Persistent bad weather has hindered the last plantings of potatoes and cultivation of the fields but in general the plants have branched satisfactorily. In some departments an extension of the crop is reported but in others a large part of the sowings could not be effected due to bad weather.

*Great Britain and Northern Ireland* : The area under potatoes in England and Wales is forecast to be a little larger than last year. Early potatoes, although backward, were looking well and making satisfactory progress where showing despite the cold, wet and sometimes frosty weather during May. Main crop potatoes had a healthy and promising appearance.

In Northern Ireland, planting of potatoes was practically completed in May and except in very isolated cases the crop was looking well and making satisfactory growth. Night frosts, however, damaged some fields, particularly early varieties. Given a continuance of suitable weather for growth and non-appearance of blight, yields should be satisfactory.

*Potatoes.*

COUNTRIES	AREA					CROP CONDITION (†)								
	1932	1931	Average 1926 to 1930	% 1932		I-VI-1932			I-V-1932			I-VI-1931		
				1931 = 100	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)
						a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany . . . { s)	...	598	592	...	...	2.7	—	—	—	—	—	2.7	—	—
{ t)	...	6,381	6,390	...	...	2.9	—	—	—	—	—	2.8	—	—
Austria . . . { s)	...	61	50	...	...	2.4	—	—	—	—	—	2.6	—	—
{ t)	...	417	409	...	...	...	...	...	—	—	—	2.7	—	—
Bulgaria . . . .	37	31	28	120.7	124.3	150	—	—	—	—	—	150	—	—
Luxemburg . . .	40	41	40	96.0	99.0	2.6	—	—	—	—	—	2.4	—	—
Malta . . . . .	7	7	7	108.1	100.3	—	—	—	—	—	—	—	—	—
Netherlands . .	434	406	428	107.1	101.5	—	(1) 65	—	—	—	—	(1) 70	—	—
Poland . . . . .	...	6,716	6,250	...	...	(3) 3.3	—	—	—	—	—	(2) 3.3	—	—
Switzerland . .	...	113	119	...	...	—	—	96	—	—	—	—	—	99
Czechoslovakia .	1,787	1,778	1,772	100.5	100.9	2.6	—	—	—	—	—	2.6	—	—
—														
Algeria . . . . . s)	28	27	25	104.2	112.0	—	100	—	—	—	—	—	—	75

(†) For the explanation of signs and figures indicating crop condition, see maize table and note on page 367.—  
s) Early potatoes. — t) Late potatoes. — (1) To 5 of the month. — (2) Middle of the month.

*Hungary* : The rains have accelerated the growth of potatoes. On about 10 June hoeing was begun. The early varieties were in flower.

*Italy* : In May crop condition of potatoes was good.

*Malta* : Production of potatoes in 1932 is estimated at 564,000 centals (941,000 bushels) as against 670,000 (1,117,000) in 1931 and 636,000 (1,060,000), the average for the five-year period 1926-30. Percentages: 84.2 and 88.7.

*Switzerland* : Potato planting has been considerably delayed; the young plants are at present growing well.

*Argentina* : Lifting of potatoes has been effected under relatively good conditions and yields have been below those of last year.

According to the first official estimate, the area planted to potatoes during the season 1931-32 is estimated at 371,000 acres against 435,000 in the preceding season and 340,000 on the average for 1925-26 to 1929-30 ; percentages : 85.1 and 109.1.

Production amounted to 20,286,000 centals (33,809,000 bushels) in the season 1931-32 against 27,583,000 (45,970,000) in 1930-31 and 17,419,000 (29,031,000), the average for the five seasons 1925-26 to 1929-30 ; percentages : 73.5 and 116.5.

*Canada* : According to a cable from the Canadian Government dated 14 June the potato acreage will be reduced.

*United States* : On about May 26, potato planting was well advanced to the northern parts of the country with many fields up and cultivated ; lifting was favoured in parts of the Southeast but was delayed in Florida.

*Cyprus* : The new crop was very promising in May and lifting was in progress.

*Algeria* : Rainfall at the end of April and especially at the middle of May was extremely beneficial to the spring and summer sowings, the former having previously suffered somewhat from drought.

## SUGAR

During May and the first few days of June, the weather continued to be variable and rather cold for the season but in most of the beet-producing countries of Europe it was more favourable to sugar beet than in the preceding month. Germination took place satisfactorily, and in the fields the plants are uniform and of good colour. Growth is backward, because sowing was delayed, but regular. Some attacks of insects and disease and spreading of weeds are reported nearly everywhere and are fairly intense in Austria, Belgium and Spain but have not yet, however assumed dangerous proportions.

Exceptions to this generally satisfactory state of affairs are France and Great Britain, where bad weather rendered the last sowings and field work difficult and general conditions of growth appeared to be unfavourable. In France, however, it seems that in the last few days some improvement has already been noted.

No especially noteworthy changes have been made in the table containing the estimates of areas sown to sugar beet ; the only important change is that for Czechoslovakia for which the figure previously transmitted by the Government has been replaced by a more recent Government estimate which approaches that estimated and published by the Institute in the April Crop Report.

For the U. S. S. R., as news varies greatly and is sometimes contradictory, the first estimate, which still seems the closest to the actual facts, is left unchanged.

There have been newly inserted the first estimates of the probable beet areas in Canada and the United States for which slight increases are anticipated compared with last year.

Totalling the data for Europe and America a figure is obtained for the world beet

area very slightly exceeding that of last year and 15 % above the five-year average of 1926-1930; if, however, the U. S. S. R. is excluded, there is instead a general decrease of 10 % compared with 1931 and of 22 % compared with the average.

\* \* \*

*Germany*: Crop condition of the beet is in general satisfactory. Thinning of the young plants has begun.

*Austria*: The beet have not come up regularly. At the beginning of June, hoeing of early sowing had been mostly finished. In the most important beet producing areas, animal parasites have caused serious damage, often necessitating re-sowing.

*Belgium*: Sugar beet sown recently have germinated rapidly. In various regions, the under-sides of the leaves of the young beet plants are covered with eggs of the beet-fly and an invasion of these insects is feared. Steps are being taken to combat this pest.

#### *Acreege of Sugar Beet.*

COUNTRIES	1932 (*)	1931	Average 1926 to 1930	% 1932	
				1931 = 100	Average = 100
	Acres				%
Germany. . . . .	582,348	786,002	1,039,694	71	54
Austria . . . . .	107,500	106,000	69,381	101	155
Belgium . . . . .	150,000	140,178	154,685	106	96
Bulgaria . . . . .	29,500	37,000	46,387	80	64
Denmark. . . . .	39,000	74,600	90,659	119	98
Spain . . . . .	200,000	250,000	165,519	80	119
Irish Free State . . . . .	13,100	5,012	14,246	258	91
Finland . . . . .	6,200	4,990	5,281	124	117
France. . . . .	605,000	599,500	629,233	101	96
Great Britain. . . . .	280,000	234,174	228,923	119	125
Hungary . . . . .	85,260	138,475	171,953	62	50
Italy. . . . .	166,800	263,700	252,128	63	66
Latvia . . . . .	17,000	11,100	5,200	156	383
Netherlands. . . . .	111,000	92,609	152,926	120	73
Poland . . . . .	821,000	387,200	516,594	76	62
Rumania . . . . .	50,000	37,000	157,702	133	31
Sweden . . . . .	96,990	37,170	75,428	113	131
Switzerland . . . . .	8,200	3,200	3,573	100	90
Czechoslovakia . . . . .	350,000	480,871	686,664	76	55
Turkey . . . . .	35,062	20,000	20,750	177	169
Yugoslavia . . . . .	90,740	91,200	119,440	100	76
Total Europe a). . . . .	3,389,700	3,809,931	4,551,416	88	74
U. S. S. R. . . . .	4,127,000	3,693,800	1,869,132	112	221
Total Europe b). . . . .	7,496,700	7,503,731	6,420,548	100	116
Canada . . . . .	52,000	51,000	47,870	102	109
United States. . . . .	735,000	720,000	710,218	102	103
Total America . . . . .	787,000	771,000	757,888	102	104
General totals: . . . . . (a)	4,156,700	4,593,931	5,309,304	90	78
(b)	8,283,700	8,274,731	7,178,436	100	115

(\*) Approximate data.

(i) Average 1929 and 1930. — a) Not including the U. S. S. R. — b) Including the U. S. S. R.



*Spain* : The germination of sugar beet has taken place generally under good conditions and the weather has not been very favourable for the propagation of "pulguilla" which is most dangerous to the beet at this period. As sowing has been effected rather late, the area sown is still unknown but is estimated to be 15-20 % smaller than that of last year.

*France* : The persistent bad weather has retarded the last beet sowings and tillage of the soil. Brairding has not always been satisfactory and the young sowings are weak in places ; the fields are in general infested with weeds and vermin have caused some fairly considerable damage in certain districts. If normal weather for the season sets in during the latter half of June the situation will, however, become satisfactory as the soil is abundantly supplied with moisture.

*Great Britain and Northern Ireland* : It is estimated that the sugar beet area in England and Wales will probably be a little larger than in 1931. The plants were fairly regular but conditions in May were generally adverse with cold, wet weather and some frosts, retarding sowings.

*Hungary* : Rainfall in the last week of May and the first week of June greatly benefited the beet. The first weeding has everywhere been finished.

*Italy* : During May crop condition was normal.

*Switzerland* : A considerable delay to beet sowings has been incurred but the young plants are at present growing well.

*U. S. S. R.* : The area of sugar-beet sown on 10 June was 3,865,000 acres, 93.7 % of the Plan, against 3,699,000 at the same date last year.

*United States* : In the week ended on 26 May, sugar beet planting was about completed with thinning general in places ; sugar cane made good progress in Louisiana and greatly improved in the Southeast.

*Mexico* : Cutting of sugar cane in the principal centres of production has been effected under generally favourable conditions. It is confirmed that production will be much smaller than that of last year. Frost in the first half of April seriously damaged crops in various areas.

*India* : In the United Provinces, light rain fell in parts of some districts in the week ended on 14 May. Hail caused some damage in a few districts. From 14 May to June 4 no rain fell and on the latter date condition was fair and prospects good. Little rain fell in the Punjab in the second and third weeks of May but in the last week of the month rain fell in montane and parts of submontane and central tracts. The first week of June was mostly dry and on the 6th condition was average to good on

irrigated areas and below the average. to average on unirrigated. Rainfall varied greatly in Bihar and Orissa in the latter half of May from nil in some districts to heavy in others. Condition on 30 May was good except in Champaran and Bhagalpur.

*Java*: According to the *Proefstation voor de Java-suiker industrie* the rains during May were in general very heavy. Floods occurred locally and here and there lodging of the cane is reported. Yields are generally good. In some places the cane is too ripe. Work for the new plantations is advancing well.

*Production of Cane Sugar.*

COUNTRIES	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	1931-32 (1)	1930-31	Average 1925-26 to 1929-30	Percentages for 1931-32	
							1930-31 = 100	Average = 100
							%	
Thousand centals			Short tons			%		
AMERICA.								
Argentina . . . . .	7,622	8,412	8,811	281,124	420,595	440,541	91	86
Brazil . . . . .	21,805	20,656	19,385	1,080,000	1,032,788	969,247	105	111
Cuba . . . . .	60,603	69,906	104,428	3,031,000	3,495,292	5,221,343	86	58
Ecuador . . . . .	423	425	432	21,160	21,800	21,677	99	98
United States . . . . .	3,120	3,674	1,911	156,000	183,693	95,675	85	163
Guadeloupe . . . . .	816	375	542	41,000	10,000	27,100	218	150
British Guiana . . . . .	2,639	2,826	2,570	131,900	141,280	128,504	93	103
Jamaica . . . . .	1,477	1,279	1,329	74,000	64,000	66,438	115	111
Mexico . . . . .	5,070	5,247	4,242	254,000	262,000	212,109	97	119
Peru . . . . .	10,196	9,480	8,009	509,800	470,000	400,458	108	127
Puerto Rico . . . . .	19,417	15,673	13,716	970,851	783,664	685,809	124	142
Dominican Republic . . . . .	8,985	7,892	7,707	449,261	394,608	385,339	114	117
El Salvador . . . . .	666	1,024	507	33,289	51,210	25,353	65	181
Total, America . . . .	142,666	116,869	173,589	7,133,600	7,339,900	5,679,393	97	82
ASIA.								
Formosa . . . . .	20,463	17,577	13,629	1,023,155	878,841	681,427	116	150
India . . . . .	86,912	72,083	66,618	4,346,000	3,604,000	3,390,880	121	130
Japan . . . . .	2,072	1,714	1,821	103,586	85,876	91,040	121	114
Java . . . . .	54,565	62,733	57,172	2,725,000	3,136,602	2,858,554	87	95
Philippine Is. . . . .	20,720	18,796	16,404	1,036,000	939,771	820,180	110	126
Total, Asia . . . .	184,732	172,903	155,644	9,237,000	8,644,890	7,782,081	107	119
AFRICA.								
Egypt . . . . .	3,197	2,685	2,094	159,800	134,300	104,691	119	153
Mauritius . . . . .	3,616	4,871	5,041	181,000	243,580	262,045	74	72
Mozambique . . . . .	3,417	1,907	1,622	171,000	95,300	81,076	179	211
Reunion . . . . .	946	1,111	1,116	47,812	55,567	55,775	85	85
Union of S. Africa . . . . .	6,518	7,880	5,297	325,900	393,000	264,868	83	123
Total, Africa . . . .	17,694	18,434	15,170	885,000	921,727	758,455	96	117
OCEANIA.								
Australia . . . . .	13,149	11,927	11,283	657,000	596,374	564,162	110	116
Hawaii . . . . .	19,960	19,160	17,340	998,000	958,000	867,007	104	115
Fiji Is. . . . .	1,819	2,019	2,002	90,900	101,000	100,083	90	91
Japanese mandated territ. . . . .	964	850	279	48,175	42,513	18,950	113	345
Total, Oceania . . . .	35,892	33,956	30,904	1,794,000	1,697,887	1,546,202	106	116
General Totals . . . .	390,984	372,162	373,307	19,049,000	18,604,404	18,765,131	102	102

(1) Approximate data.

*Egypt*: During May weather was favourable to growth, though changeable during the greater part of the month. Sowing of the late crops is over. Manuring, hoeing and watering are in progress. Crop condition on 1 June was 100, as on 1 May and on 1 June 1931.

*Mauritius* : In 1931-32 there were 34,080,000 centals (1,704,000 short tons) of cane crushed against 44,611,000 (2,231,000) in 1930-31 and 47,803,000 (2,390,000) on the average of the five years ending 1929-30. Percentages 76.0 and 71.0.

*Union of South Africa* : The April crop condition for sugar averaged 12 % below normal. Rainfall averaged 4 ½ inches and was well distributed on the northern coast of Natal but the south coast received only light rains. The weather was favourable for the growth of cane. Mills had not yet commenced grinding as the rains had delayed ripening of the cane.

## VINES

*Germany* : Due to the prolonged winter bud formation has been rather delayed but, following warm, damp weather in May, arrears of growth have been made up. Except in the lower areas, bud, formation is satisfactory. No night frosts occurred during May.

*Austria* : At the end of May the vines were exceptionally luxurious.

*Bulgaria* : The vines promise to yield a very good crop.

*Spain* : The month of May was marked in the Centre and North by abnormal conditions and low temperatures. Sharp frosts occurred in the last few days of the month ; despite backwardness in growth, many of the buds formed were affected ; the damage seemed to be rather serious in some areas but it is impossible to estimate the total loss. In the southern regions, vines were in good condition, fruit formation was abundant and growth satisfactory. At the end of May no outbreaks of cryptogamic disease had been reported but there were numerous reports of vine pyralid in some vineyards of the centre and spreading of phylloxera in places. Business varied according to region but prices were maintained almost everywhere ; quantities of the old crop still to be sold appear to be rather small. Fruit has formed well although a little in delay, permitting some damage by late frosts in some central areas. Crop condition on 1 June, however, was good and equivalent to 110 by the Institute's system.

*France* : The month of May was marked by the persistence of quite abnormal conditions for the season, rain, low temperatures and lack of sunshine. Although in the South there were some fine days towards the end of the month, violent storms accompanied by hail occurred in the first week of June over rather large areas of the South and Southwest ; the hail caused some grave damage but, as always, its extent was only very local and had no influence on the prospects for the crop as a whole. All danger of frost has passed, even in the most exposed vineyards of the Centre and East, and it appears certain that the losses incurred are relatively small. Growth is everywhere backward but generally the vegetation has a good aspect. Fruit formation has been satisfactory almost everywhere but it is to be feared that flowering will be retarded in the southern vineyards if the weather remains wet and cold. The humidity of the atmosphere and soil particularly encourage cryptogamic disease ; powdery vine mildew is apparently spreading among the

vines affected last year and fairly numerous cases of mildew have been reported from all southern vineyards ; at the moment, the latter infection is limited almost exclusively to the leaves and the fruit is affected only in rare cases ; treatments have been very actively applied in all regions as fears of an outbreak are spreading also in the vineyards of the Centre and East. On the contrary, few moths have been noted this year. The bad weather has also hindered cultivation ; pruning has been completed under good conditions in the Centre and East. The abundant soil moisture will safeguard the southern vineyards from the danger of an eventual prolonged drought. The aspect of the vines therefore still permits the hope of a good crop ; the greater possibility than last month of serious attacks of cryptogamic disease is a cause of the great uncertainty in the present situation.

*Hungary* : Due to the rains, flowering of the vines, excepting the early varieties, was somewhat retarded. Generally only slight damage by hail and parasites is reported.

*Italy* : Fruit formation has been generally abundant and the state of growth is good in all regions. The persistence of wet weather with storms and hail, which have caused some local damage, gave rise to fears of severe outbreaks of cryptogamic disease, the development of the spores having been favoured by the alternation of rain and scirocco ; some infected spots have already been reported in certain regions ; treatment has been actively applied.

Towards the end of May all markets became calmer ; the few transactions were limited to some purchases for local trade. After remaining rather firm due to the uncertain crop condition, prices at the beginning of June again showed a tendency to fall, weakening the disinclination of owners to sell, as many of them in the large producing areas have still to liquidate fairly large quantities of wines of inferior quality and doubtful keeping quality.

*Rumania* : At the beginning of June the crop condition of vines was satisfactory.

*Switzerland* : The growth of vines has been delayed by the return of cold weather but at present is making appreciable progress.

*Argentina* : Wine production in the two provinces of San Juan and Mendoza which contribute nearly the whole of the Argentine production, should, according to a preliminary official estimate, be 47,581,000 Imperial gallons (57,140,000 American gallons), exceeding the figure given in the Crop Report of last March by about 10 %. Stocks in existence at the end of 1931 were estimated at 136,979,000 Imperial gallons (164,499,000 American gallons), giving a total supply of about 184.8 million Imperial gallons (221.9 million American gallons).

Home consumption, estimated at 8,799,000 (10,567,000) per month, should, from now until 1 October 1933, which is the date from which the government authorises the sale of the new crop, absorb about 191.4 millions (230 millions), so that the supplies as at the beginning of 1932 should be largely absorbed in the period from now until the beginning of the season 1933-34.

This result roughly agrees with the estimate given the Crop Report of last March, in

which an estimate of 37.4 millions (50 millions) was made of the stocks in existence on May 1933, which should be marketed in the four months June to October.

Two conditions must, however, be fulfilled for this result to be attained, first, that the Government does not advance the date for the sale of the 1933 production and second, that the quantities of wine estimated above are not artificially increased by sugaring; the abnormal quantity of sugar acquired in the single province of Mendoza immediately after the frosts that caused the loss of the larger part of the crop makes it doubtful whether the latter condition will be fulfilled. Further consumption would have to be maintained at the level indicated above.

*Palestine* : In the plains the crop throughout the country is about normal. In the hills the yield is expected to be above the average. Crop condition as at 1 June was good. Flowering was taking place under good conditions. During May the weather was cool.

*Syria and Lebanon* : Crop condition on 1 June was 97 against 100 on 1 May. Flowering occurred under average conditions.

*Turkey* : In May the vines in the province of Kayseri suffered a little from the cold.

*Algeria* : Rainfall at the middle of May was beneficial to the vineyards in Oran in the western part of the colony but soil moisture there is still insufficient and the crop is consequently in danger from the heat and scirocco, which supervene during the summer; the level of well water is not very high and will not permit abundant watering. In the central and eastern districts of the departments of Algiers and Constantine, the rains were quite beneficial but the misty nights, the dense fogs on some mornings and the cloudy, damp weather which prevailed in the latter half of May encouraged cryptogamic disease; outbreaks of mildew are only very local in extent and have been restricted by energetic treatment; powdery vine mildew has spread in the low-lying areas. Flowering conditions have, moreover, been rather unsatisfactory due to the moisture and fairly extensive dropping is reported. Field operations are however, taking place under excellent conditions. Although the vegetation is healthy and vigorous, the general situation in the Algerian vineyards at the beginning of June, therefore, was not very good; although condition was given as 100 this seems a little too high, especially as it does not correspond to the usual interpretation of a condition qualified as "average". Present prospects do not, in any case, indicate an abundant crop. This situation has strengthened the position of viticulturalists; the Algerian market remains quiet and prices are fairly firmly maintained despite the production surplus, largely held up, which hinders business.

*French Morocco* : The vines are very healthy and in satisfactory condition.

*Tunis* : Weather conditions have on the whole favoured the growth of vines. Flowering took place satisfactorily and until now no cryptogamic disease has been reported so that apart from misfortune up to vintage time, a good crop may be counted upon.

*Australia* : The latest information collected during the vintage confirms the fact that this year's crop is definitely below the average. In South Australia, which contributes about

3/4 of the production of the Commonwealth, the yields of the irrigated vineyards are 35-40 % below the average whereas those of the irrigated vineyards are passable; the crop of New South Wales is also mediocre; the relatively less important crop of Victoria is the only good one. Total production should consequently hardly exceed the 13,078,000 Imperial gallons (15,706,000 American gallons) produced in 1931 according to the latest estimate; the figure of 13 million Imperial gallons (16 million American gallons) published last month, although only approximate, seems, therefore, to be correct. Quality of the vines should in general be mediocre owing to abundant rainfall during the vintage.

Stocks in existence on 31 December 1931 were officially estimated at 14,991,000. Imperial gallons (18,003,000 American gallons) or slightly smaller than those of 31 December 1930. It is found, therefore, that on the one hand wine sales last year amounted to 13,251,000 Imperial gallons (15,913,000 American gallons), a figure which indicates a large regression in consumption compared with previous years; on the other hand, total supplies at the beginning of the wine season 1932-33 appeared to considerably exceed market requirements. Prices remained so low that viticulturalists could not only not hope to sell more than 2/3 or 3/4 of their crop but could not even count upon doing so for a price covering costs of production.

Concordant information from private sources indicates that the discouragement of growers is leading them to uproot their vines; the estimate at present known of the vine area in 1931 shows a small reduction from the preceding year.

## OLIVES

*Spain*: Flowering of olives is very profuse and generally seems to promise a good crop. Crop condition on 1 June was 100, equivalent to good by the Spanish system.

*Greece*: According to the latest information communicated by the Ministry of Agriculture, production of olive oil in 1931 is estimated at 2,202,000 centals (28,940,000 American gallons), exceeding the preceding estimate by 251,000 (3,294,000). Production in 1931 exceeds that of 1930 by 2.6 % and the average of 1925-1929 by 32.4 %.

*Italy*: Flowering of olives is profuse and very promising.

*Palestine*: The flowering of the olive was taking place under fair conditions, and has been very heavy, but the setting of the fruit is poor. The crop will be considerably smaller than last year's in most areas. During May the weather was cool.

*Syria and Lebanon*: Crop condition on 1 June was 95 against 100 on 1 May. Flowering occurred under good conditions.

*Algeria*: Rainfall at the middle of May was beneficial to olives but flowering took place under rather defective conditions due to wet weather in the latter half of May. Crop condition on 1 June was reported to be "average" and also "100" although these two indications do not usually denote the same condition.

*French Morocco* : Flowering has been very profuse.

*Tunis* : The weather conditions have on the whole favoured the growth of olives, which have flowered satisfactorily and on 1 June were in good condition (120).

## COTTON

*Bulgaria* : The area planted to cotton this year (30,000 acres) is more than double that of 1931 (13,000 acres) and the average of 1926-1920 (12,000 acres). Despite some late frosts the growth of cotton was good during May thanks to frequent rains. Crop condition on 1 June was 150 (by the Institute's system) against 125 at the same date last year.

*Greece* : The latest estimate of production of raw cotton in 1931 shows a decrease of 11,000 centals (2,300 bales) compared with the preceding estimate. Production of ginned cotton is estimated at 58,000 centals (12,000 bales) against the previous estimate of 61,000 (13,000) compared with 1931 (77,000 centals ; 16,000 bales) and the average of 1925-1929 (72,000 ; 15,000) there are decreases of 25.3 % and 19.7 % respectively in the production of ginned cotton.

*Italy* : Conditions are very adverse to growth.

*U. S. S. R.* : Sowings of the cotton were practically terminated on 5 June, 5,802,000 acres, 95.5 % of the Government plan, having been sown, against 5,281,000 last year.

*United States* : According to a cable of 26 May from the Department of Agriculture the weather had been too cool for the growth of cotton: rainfall was sufficient for immediate needs. In the week ended on 2 June temperatures were mostly seasonable although rather too low for good growth in most northern sections, especially Oklahoma. Rain was needed in northern North Carolina, parts of Tennessee and in Oklahoma but in nearly all other sections moisture was sufficient for immediate needs. In Texas progress and condition were fair to good with abundant sunshine and moderate temperatures. In the following week, ended on 9 June, the cotton crop made satisfactory progress. On 16 June the cotton crop was making fairly satisfactory progress.

According to a later telegram of 23 June the cultivation of cotton was in progress in the western section of the cotton belt but in the eastern section the weather was too wet.

*Cyprus* : Planting of cotton was in progress at the middle of May; the area is greatly reduced.

*India* : In the week ended on June 4 rain fell only in the arid zone; sowing of early cotton was in full swing along the Deccan canals. In the following week rainfall was

fairly good in Konkan and the south of the Deccan. Cotton sowings were completed in the south of the Deccan. In the Central Provinces the weather in the latter half of May was mostly hot with occasional clouds, and light showers; in the first week of June it was cloudy and light rain fell in two districts. In the Punjab during the last three weeks of May and the first week of June little rain fell except in the last week of May when the maximum was 2.78 inches and the minimum 0.01 inch. There were reports of local damage by insects on 6 June condition was average to good on irrigated areas and below the average to average on unirrigated.

*Syria and Lebanon* : The area planted to cotton in the territory of the Government of Latakia has been reduced to 7,400 acres compared with 13,500 in 1931 and the land released has been devoted to market-garden crops. The area in the State of Syria is not yet known.

*Turkey* : According to information received by the Mersina Chamber of Commerce the production in that province, which supplies about 30 per cent of the total crop, appears to be larger than last year. The recent rains were very favourable. A production of over 350,000 centals raw cotton against 320,000 in the preceding season is expected.

*Algeria* : Cotton growing is tending to be abandoned, at least temporarily, in Algeria; 860 acres against 3,200 in 1931-32 and 14,200, the average for the preceding five seasons; the maximum was 22,000 in 1926-27.

*Egypt* : The weather in May was not wholly favourable to growth but it may be considered in general better than that in April. Temperatures were abnormally cool during the first three weeks, with strong winds, overcast sky, mists and very damp nights, the whole exercising an unfavourable effect on the young plant, especially in the Delta. A delay of ten to twenty days in growth is noticeable, according to locality. Temperature in the last days of May was more favourable and condition of the plants began to improve. Irrigation water is sufficient.

The final estimate of production for the season 1930-31 is 8,197,000 centals (1,715,000 bales) of ginned cotton and 16,731,000 centals (837,000 short tons) of cotton seed, the yields being 379.2 lb. and 7.7 centals (0.4 short tons) per acre respectively. This estimate is 258,000 centals (54,000 bales) of ginned cotton above the third and latest estimate of production published by the Government in June 1931. The third and latest estimate of production for the current season 1931-32 is 6,153,000 centals (1,287,000 bales) of ginned cotton on an area of 1,747,000 acres, the yield being 352.2 lb. per acre. Compared with the final figure of production for the season 1930-31 there is a decrease of 24.9 %, whereas compared with the average for the five seasons 1925-26 to 1929-30 the decrease is only 18.9 %. The first and second estimates for the current season were published in the Crop Reports for October and December 1931 respectively. The third estimate is slightly above the second but it is below the first by about 201,500 centals (42,100 bales) of ginned cotton. While last year the ginning was delayed until July 20, this year it was finished by the end of March. The third estimate is based on the quantity ginned in this period (see April Crop Report) and on the quantities still not



ginned at this date, taking into account the stocks of the previous crop in existence in the country apart from Alexandria.

According to the third estimate, the production of ginned cotton may be subdivided as follows : Sakellaridis : 1,303,000 centals (273,000 bales) ; other long staple varieties (Maarad, Sakha 4, Giza 7) : 477,000 centals (1,000,000 bales) ; medium staple varieties (Casulli, Nahda, Foadi) : 273,000 centals (57,000 bales) ; short staple varieties (Piliou, Ashmuni, Zagora, Giza 3, etc.) : 4,099,000 centals (858,000 bales). According to the third estimates for the seasons 1930-31, 1929-30 and 1928-29, production of Sakellaridis cotton (ginned) was 2,051,000 centals (429,000 bales) ; 2,670,000 (559,000) and 2,509,000 (525,000).

*Uganda* : The approximate quantity of seed cotton marketed to the end of April 1932 in the various provinces is equivalent to about 756,000 centals (158,000 bales of 478 lb.) of ginnet cotton, as against 676,000 centals (141,000 bales) for the same period of last year (111.8 %). The final figures will probably show a slight increase on this figure.

*Anglo-Egyptian Sudan* : The latest report of the Government at Khartum on Sudan cotton gives an area of nearly 336,000 acres, representing a decrease of 13 % compared with that of last year, which was the largest area on record and nearly 30 % above the average for the preceding five seasons. Production is estimated at about 976,000 centals (204,000 bales) of ginned cotton against 509,000 (106,000) in 1930-31 (which was the smallest crop since 1925-26) and 599,000 (125,000), the average for the five seasons 1925-26 to 1929-30 ; increases : 92 % and 63 % respectively. Cotton growing in the Sudan may be divided into two groups : namely, of irrigated and rain-grown crops. The former may in turn be divided into crops irrigated by flooding and crops irrigated by means of pumps. The flood irrigation method is used principally in the Gezira area (80 %) and those of Kassala and Tokkar, covering 90 % of the total cotton area of the Sudan and producing exclusively the Sakellaridis variety. The area under this variety, a small quantity of which is also grown by use of the artificial irrigation method, is this year about 263,000 acres, 15 % smaller than the record area of last year and 32 % above the average for the previous five seasons. Production of Sakellaridis is, on the contrary, this year estimated at 887,000 centals (185,000 bales) of ginned cotton (91 % of the total production), representing an increase of 125 % on the Sakellaridis crop of last year, which was the smallest obtained in the Sudan since 1925-26, an increase of 70 % compared with the average of the five seasons 1925-26 to 1929-30 and an increase of 67 % in comparison with the largest Sakellaridis production to date in the Sudan (season 1928-29). The artificially irrigated crops (Berber, Dongola and Zeidab) and those rain-grown (Provinces of the Blue Nile, Fung, Kassala and the White Nile in the North ; Provinces of Kordofan, Mongalla and the Upper Nile in the South) consist of an American variety. The former covers a rather small and decreasing area except in the Zeidab district which is the most important centre for this crop (50 %). The rain-grown system is used principally in the Kordofan area (65 %) ; its area has greatly increased since 1925-26 but the yields obtained are very low.

The quantity of cotton harvested in the whole of the Anglo-Egyptian Sudan up to the end of April, 1932 is 933,000 centals (195,000 bales) of ginned cotton (of which 90 % Sakellaridis), against 489,000 (102,000) in 1931, 601,000 (126,000) in 1930, 642,000 (134,000) in 1929 and 487,000 (102,000) in 1928.

*Tanganyika*: Crop condition in April was satisfactory enough. Some damage has been caused by floods.

*Union of South Africa*: The crop this year is very late. As a result of the low price of lint, the value of the seed cotton is in many cases exceeded by the costs of ginning and railage. Consequently many farmers are holding up their crops and postponing railage until a more favourable period. Production of seed cotton is estimated at 13,600 centals (2,850 bales), showing a considerable reduction compared with the previous estimate (17,200 centals or 3,600 bales) and representing only 42.8 % of the 1930-31 crop and 31.5 % of the five-year average.

### FLAX

*Austria*: At the beginning of June flax was sprouting uniformly.

*Belgium*: The flax crop appears to be in good condition but is backward; the acreage of the crop has been greatly reduced.

#### Area and Crop Condition of Flax.

COUNTRIES	AREA SOWN					CROP CONDITION (†)								
	1932	1931	Average 1926 to 1930	% 1932		1-VI-1932			1-V-1932			1-VI-1931		
	1,000 acres			1931 = 100	Aver. = 100									
						a)	b)	c)	a)	b)	c)	a)	b)	c)
Austria . . . . .	...	8 (†)	10	...	...	2.6	—	—	—	—	—	2.4	—	—
Bulgaria . . . . .	2	2	1	98.3	281.1	150	—	—	—	—	—	120	—	—
Netherlands . . . . .	...	16	37	...	...	...	...	...	—	—	—	60	—	—
Rumania . . . . .	...	...	...	...	...	e)	—	—	—	—	—	—	—	—
Czechoslovakia . . . . .	20	23	46	87.7	43.5	—	—	—	—	—	—	—	—	—
Canada . . . . .	559	627	511	89.1	109.3	—	—	—	—	—	—	—	—	—
India . . . . .	3,241	3,008	3,224	107.7	100.5	—	—	—	—	—	—	—	—	—
French Morocco . . . . .	61	89	50	68.6	122.4	—	—	—	—	—	—	—	—	—

For the explanation of a), b), c), †), see note page 367. — (1) Average 1927 to 1930. — (2) Flax and hemp. — (3) Middle of month. — (4) Winter crops.

*France*: In the North, the flax crop situation was good but acreage relatively small.

*Great Britain and Northern Ireland*: The 1932 flax acreage in Northern Ireland will be greatly reduced even when compared with last year. The crop has braided well and is in healthy condition generally.

*Hungary* : In various districts flax is backward in growth. After the rains at the end of May and the beginning of June, the crops began to improve.

*U. S. S. R.* : The area sown to flax ("dolgunetz" and "kudriash" varieties) as on June 10 was 6,282,000 acres, that is, 77.5 % of the State plan compared with 5,513,000 sown at the same date last year.

*Argentina* : The weather during May was generally favourable to tillage and the sowings. It is confirmed that the flax area will be 10 % smaller than that of last year, which was roughly 8 ½ million acres. In some regions the crop was backward.

*United States* : In the week ended on June 2 flax was still being sown in the northern States.

*India* : According to the final report, production of linseed in India in 1931-32 is estimated at 9,206,000 centals (16,440,000 bushels) against 8,445,000 (15,080,000) in 1930-31 and 8,355,000 (14,920,000) on the average for the preceding quinquennium ; percentages : 109.0 and 110.2.

*Algeria* : The flax area this year is 370 acres ; precise estimates for previous years are lacking but the crop seems to show a relatively large regression compared with the years 1924, 1925 and 1926. On 1 June crop condition was average (100).

## HEMP

*Bulgaria* : The area sown to hemp this year (13,400, acres) exceeds that of 1931 (9,300 acres) by 33.5 % and the average of 1926-1930 (9,500 acres) by 30.1 %. Frequent rains during May favoured the hemp crop, the condition of which on June 1 was 150 (by the Institute's system) as on 1 June, 1931.

*Hungary* : In various regions hemp was backward in growth. After the rains at the end of May and the beginning of June, the condition of the crop began to improve.

*Italy* : Towards the end of May the crop condition of hemp was good.

*U. S. S. R.* : The area sown to hemp as on June 10 was 1,653,000 acres, that is 65.3 % of the State plan and nearly the same as the area sown at the same date last year.

## HOPS

*Belgium* : Hop growing has diminished in western Flanders.

*Great Britain and Northern Ireland* : The estimated area of hops in England and Wales shows a further decrease compared with last year. Bines were backward but were

growing fast at the end of May. Drier and warmer conditions would be beneficial. Downy mildew has appeared in some districts.

*Hungary* : Towards June 10 hops were growing well.

*Canada* : The area under hops in 1931 was 925 acres compared with 948 in 1930 and 870, the average for 1925-29 ; percentages ; 97.4 and 106.3. Production was 12,300 centals against 11,700 in 1930, and 11,300, the average, respectively ; percentages : 105.5 and 108.8.

## TOBACCO

*Belgium* : Tobacco cultivation in Western Flanders has diminished.

*Bulgaria* : The area planted to tobacco this year is 76,600 acres or about the same as in 1931 and 5 % above the average of 1926-1930. Frequent rains during May were unfavourable to the growth of the crop, the condition of which on 1 June was 90 (by the Institute's system) against 95 at the same date of last year; at the beginning of June transplanting had begun in most districts.

*Hungary* : Towards June 10 transplanted tobacco was already growing under good conditions. Weeding had begun.

*Italy* : In the first half of May transplanting of tobacco continued. The final figure of area sown in 1931 has been published and is 103,000 acres compare with 108,000 in 1930 and 95,000, the average for the five years 1925 to 1929 ; percentages : 95.6 and 108.7 .

*Czechoslovakia* : The area sown to tobacco this year (23,600 acres) is 5.5 % greater than last year (22,360 acres) and 56.3 % about the mean of the five years ending 1930 (15,100 acres).

*United States* : In the week ended on May 26 setting of tobacco was delayed by dryness in Tennessee while in Kentucky growth was irregular with rain and warmth needed. A special survey made by the Department of Agriculture on the condition of tobacco plants in the flue-cured States indicates a material loss of plants in seed beds due to the effects of the March freezes and blue mould infection. Although many beds were re-seeded, the loss from the above causes has resulted in a scarcity of good plants and some delay in transplanting. The damage has been most severe in Georgia, Florida, South Carolina, and Eastern North Carolina, with lesser damage in the old belt areas of Virginia and North Carolina.

*Palestine* : The crop is developing well under favourable climatic conditions. Larger areas of tobacco appear to be planted this year owing to slightly higher prices obtainable.

*Syria and Lebanon* : In Lebanon the area sown is the same as that of last year, 4,400 acres, prices being low. In Latakia 2,500 acres have been sown against 7,400 last year. In Syria and Alexandretta the area this year is not yet known. In Jebel Druze 4,200 lb. was harvested in 1931 but growers appear to have given up the crop in 1932 owing to the very low prices.

*Turkey* : Oppressive heat was recorded at the beginning of June in the Smyrna region and is considered to have been injurious to all crops and particularly to tobacco plants, which were yellowing and had ceased growing.

*Algeria* : The area planted is slightly smaller by 8.5 % than that of last year (52,000 instead of 57,000 acres) and considerably (14.4 %) below the average area for the period 1926-30 (61,000 acres) ; a fairly constant regression is to be noted in the area of this crop since 1927, in which year it was 72,000 acres. Rains at the end of April and particularly at the middle of May favoured the recovery of the plants transplanted and were generally very beneficial to the tobacco crop, the condition of which on 1 June was average and equivalent to 190 as on 1 June 1931.

## OTHER PRODUCTS

### Tea.

*Ceylon* : Wet weather conditions prevailed throughout the island during May, with an excess of rain towards the south-west. Crop condition at the beginning of the month was good.

*India* : According to a report dated May 19 received from the Department of Commercial Intelligence and Statistics, droughty conditions prevailed during the first half of April in North India but afterwards good rains fell generally and prospects improved. Statistics to the end of April recorded an increase of 2 ½ million lbs as compared with the outturn to the same date of last year.

In South India weather conditions during April were generally conducive to the growth of the crop and prospects were good ; the outturn was 22.36 % ahead of that to the same date of last year.

Despite favourable weather crop condition was mediocre on 1 June.

### Coffee.

*Tanganyika* : Crop prospects at the end of April were generally satisfactory.

### Cacao.

*Gold Coast* : There is little to add to last month's report. Returns from the districts state that at the end of April the mid-crop was practically non-existent and that the minor crop was late and very small. Many farms were carrying no crop other than small pods just set for the next major crop. Only here and there was cacao seen on the drying

trays. The weather has been hot and dry, and in Ashanti more rain was needed to aid development of the recently set pods.

Flowering for the next major crop was proceeding satisfactorily : most districts reported pod setting. These first indications points to an early and good major crop.

Crop movement has been as follows (in 1,000 lb.) :

	April 1932	October 1931 to April 1932	April 1931	October 1930 to April 1931
Arrivals at Takoradi and Accra .	1,770	245,853	14,703	261,260
Shipments per steamer from Tako- radi and Accra . . . . .	15,532	310,424	56,235	329,629
Shipments from all ports . . . .	25,395	389,863	73,414	407,765
Stocks at Takoradi and Accra beach at the end of April . . . . .	16,473	—	...	—

### Groundnuts.

*Argentina* : Yields per acre vary from 900 to 1300 lb. in the principal centres of production.

*Egypt* : During May weather was favourable to sowing, germination and growth of groundnuts. Preparation and sowing are in full swing. The growth of early crops is satisfactory.

*Tanganyika* : Harvesting of groundnuts commenced in April. Crop prospects at the end of that month were good.

*Union of South Africa* : The previous estimate of production of groundnuts (83,000 centals) has now been reduced to 69,000 centals representing 85.3 % of the 1930-31 crop and 57.2 % of the five year average.

### Colza, sesame and mustard.

*Austria* : The colza crop is short and patchy. Flowering took place under good conditions. On 1 June crop condition was 2.8 against 3.1 on 1 May 1932 and 2.6 on 1 June 1931.

*Bulgaria* : Weather conditions during last spring were not altogether favourable to the colza sowings. The area sown this year is, in fact, only 12,400 acres compared with 31,800 in 1931 and 35,500 on the average for 1926-1930. Excessive rain during May and the consequent propagation of insect pests have been unfavourable for the growth of colza, the crop condition of which on 1 June was 85 (by the Institute's system) against 135 at the same date of last year.

The area sown to sesame this year is 19,800 acres against 17,700 in 1931 and 14,500, 14,500, the average for 1926-1930 ; percentages : 111.6 and 136.7 respectively. Crop condition on 1 June was 150, the same as on 1 June 1931.

*Hungary* : On about 10 June production was forecast to be below the average.

*Poland* : The crop condition of colza on 15 May (by the Polish system) was 2.4 for the winter variety and 3.0 for the spring variety against 3.0 and 3.1 respectively at the same date of last year.

*India* : According to the final report the area of the colza and mustard crop in 1931-32 was 6,117,000 acres compared with 6,631,000 in the previous year and 6,058,000 on the average for the period 1925-26 to 1929-30 ; percentages : 92.2 and 101.0. Production is estimated at 22,915,000 centals (45,830,000 bushels) against 22,131,000 (44,262,000) in the previous year and 21,280,000 (42,560,000), the average, respectively ; percentages ; 103.5 and 107.7.

### Sericulture.

*Bulgaria* : The mulberry area this year (14,800 acres) exceeds that of 1931 (12,400 acres) by 20 % and the average of 1926-1930 (8,900), by 66 %. May weather favoured growth of the mulberry and also silkworm rearing. The quantity of silkworm eggs incubated this year in fact exceeds that of 1931 by 30 % but is still 35 % below the average of 1926-1930.

Rearing of silkworms was effected under good conditions and gives hopes of good results this year. According to the first estimate, in fact, production of cocoons should be 2,866,000 lbs against 2,746,000 in 1931 but is much below the average of 1926-1930 (4,741,000) ; percentages : 117.2 and 60.5 respectively.

*Italy* : At the beginning of the current month mulberry leaves were abundant and had not suffered as a result of the bad weather. Cases of muscardine were reported in some areas but they were not of a serious nature.

Rearing conditions are in general good. The quantity of eggs incubated this year seems to be about 15 % smaller than last year. Towards the middle of the month the weather was considered to be favourable for the final growth of the cocoons. Mulberry leaves were still plentiful and of very good quality and the average yield of eggs incubated in some provinces was larger than that of last year.

*Japan* : Weather has been unfavourable for mulberry, of which crop condition on 1 June was mediocre. On 1 June progress of rearings was average.

*Syria and Lebanon* : The quantity of eggs incubated this year is 60,300 ounces against 81,130 last year and 99,140 in the five years ending 1930. Percentages 74.3 and 60.8. The heaviest reductions were in Lebanon and Latakia owing to the fall in silk prices, which are no longer sufficiently remunerative to rearers, who are giving up the work. To remedy this state of affairs the Lebanon Government has decided to distribute eggs free for the 1932 season. Rearings on 1 June were in good condition and in general no disease was reported. An approximate estimate of the crop in fresh cocoons is 4,641,000 lb. against 6,206,000 last year and an average of 7,315,000 in the five years 1926 to 1930. Percentages 74.8 and 63.4. The heaviest reductions were in Latakia and Lebanon.

*Turkey*: In the vilayet of Brusa working of the raw cocoons has begun. The product has been bought and sold on the exchange at 81 piastres (about 2 gold francs) per kilogram. Prices are above those of last year.

### SUPPLEMENTARY INFORMATION ON LAST SEASON'S CROPS

#### Agricultural Production in Yugoslavia in 1931.

CROP	AREA HARVESTED					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	Percentages for 1931		British Measures			American Measures			Percentages for 1931	
				1930 = 100	Aver = 100	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 190	Aver. = 100
thousand acres	%	%	thousand centals										
Wheat . . . . .	5,289	5,246	4,581	100.8	115.5	59,274	48,197	48,593	th. bushels (60 pounds)			123.0	122.0
Rye . . . . .	603	610	518	98.9	116.5	4,264	4,382	4,148	th. bushels (56 pounds)			97.3	102.8
Barley . . . . .	1,065	1,097	943	97.0	112.9	8,640	8,915	8,342	th. bushels (48 pounds)			96.9	103.6
Oats . . . . .	936	1,009	904	92.7	108.5	5,837	6,283	7,548	th. bushels (32 pounds)			92.9	77.3
Maize . . . . .	5,901	5,926	5,180	99.6	113.9	70,623	76,831	67,356	th. bushels (56 pounds)			92.5	104.9
Rice . . . . .	4	4	3	88.7	106.8	44	50	40	th. bushels (45 pounds)			89.0	110.2
Meslin . . . . .	130	127	117	102.2	111.2	987	935	952	th. bushels (58 pounds)			105.6	103.7
Spelt . . . . .	41	46	45	89.6	91.5	211	275	281	thousand pounds			76.3	75.0
Potatoes . . . .	584	599	560	97.5	104.4	24,489	32,419	25,159	th. bushels (60 pounds)			75.5	97.3
Sugar-beet . . .	110	123	110	85.9	99.4	15,594	16,422	16,438	thousand short tons			95.0	94.9
Flax . . . . .	(1) 31	(1) 33	(1) 31	93.1	97.2	(a) 16	30	21	th. bushels (56 pounds)			52.1	73.6
						(b) 216	228	181	thousand pounds			94.9	119.6
Hemp . . . . .	(1) 65	(1) 94	(1) 78	68.9	83.6	(a) 22	46	25	thousand pounds			48.6	88.5
						(b) 484	729	635	thousand pounds			66.3	76.2
Tobacco . . . .	48	38	33	125.8	144.0	294	314	235	th. bushels (56 pounds)			93.6	125.2
Hops . . . . .	6	7	14	78.8	39.2	35	39	72	th. bushels (50 pounds)			90.3	48.4
Colza . . . . .	19	29	14	66.4	135.9	88	156	87	th. bales (478 pounds net)			56.3	100.5
Cotton (ginned) .	2	3	2	57.2	104.8	2	3	2	(2)   1   (2)			54.9	87.3
Vines (wine) . .	492	454	439	108.5	112.0	thousand Imperial gallons			thousand American gallons			111.9	131.5
Olive oil . . . .	—	—	—	—	—	thousands centals			thousands centals			293.9	80.7

a) Seed. — b) Flax. — (1) Flax area, including that for seed (about 10 %). — (2) Below 500 bales.



# Agricultural Production in Chili in 1931-32.

CROPS	AREA						PRODUCTION									
	1931-32	1930-31	Aver. 1925-26 to 1929-30	Percentages for 1931-32		British measures			American measures			Percentages for 1931-32				
				1930- 1931	Aver. = 100	1931-32	1930-31	Average 1925-26 to 1929-30	1931-32	1930-31	Aver. 1925-26 to 1929-30	1930- 1931	Aver. = 100			
thousand acres			thousand centals													
Wheat . . . . .	1,517	1,610	1,602	94.3	94.7	12,712	12,714	17,255	thousand bushels (60 pounds)			21,187	21,190	28,758	100.0	73.7
Oats . . . . .	166	193	193	86.4	86.2	1,575	1,635	2,199	thousand bushels (32 pounds)			4,923	5,109	6,870	96.4	71.7
Barley . . . . .	106	163	173	64.0	61.4	1,487	1,860	2,681	thousand bushels (48 pounds)			3,097	3,876	5,585	79.9	55.4
Rye . . . . .	7	8	7	88.7	95.2	46	67	66	thousand bushels (56 pounds)			82	120	118	68.3	69.1
Maize . . . . .	110	92	88	119.9	125.3	1,945	1,516	1,229	thousand bushels (56 pounds)			3,473	2,707	2,194	128.3	158.3
Potatoes . . . . .	104	111	93	94.0	111.6	9,580	9,861	8,184	thousand bushels (60 pounds)			15,966	16,435	13,556	97.1	112.3

# Agricultural Production in Korea in 1931.

CROPS	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	Percentages for 1931		British measures			American measures			Percentages for 1931	
				1930 = 100	Aver. = 100	1931	1930	Aver. 1925 to 1929	1931	1930	Aver. 1925 to 1929	1930 = 100	Aver. = 100
thousand acres					thousand centals								
Oats . . . . .	306	270	270	113.5	113.3	1,644	1,379	1,312	thousand bushels (32 pounds) 5,188 4,311 4,099			119.2	125.3
Maize . . . . .	267	263	251	101.4	106.5	1,765	1,885	1,676	thousand bushels (56 pounds) 3,152 3,866 2,993			93.6	105.3
Rice (rough). . .	4,105	3,970	3,885	103.4	105.7	63,283	76,746	59,472	thousand bushels (45 pounds) 140,625 170,543 132,158			82.5	106.4
Potatoes . . . . .	283	220	197	105.7	118.4	9,851	12,265	9,968	thousand bushels (60 pounds) 16,418 20,442 16,805			80.3	98.9
Sugarbeet . . . .	2	2	2	112.6	149.4	292	231	129	thousand short tons 15 12 6			126.7	227.5
Hemp (fibre) . . .	69	71	73	96.5	94.6	433	462	459	thousand pounds 43,304 46,189 45,912			93.8	94.3
Cotton (ginned) .	471	473	495	99.5	95.0	482	714	555	thousand bales (478 pounds) 101 149 188			67.6	78.4

## FODDER CROPS

*Germany* : The meadows, pastures and fields of clover and alfalfa have grown very well and the first cutting is expected to give satisfactory yields.

*Austria* : At the beginning of June mangolds had a not altogether satisfactory aspect due particularly to damage by animal parasites.

Temporary meadows have not been able to grow normally owing to lack of moisture. Red clover is short and thin, especially in the plains. The first cutting has begun in places thanks to the good progress of flowering ; The yield of alfalfa is entirely unsatisfactory. Owing to the shortage of other fodder, alfalfa has frequently been excessively used. Growth of the meadows and pastures is not satisfactory.

*Belgium* : Fodder crops (meadows, clover, alfalfa, etc.) have braided well and will give full yields.

*Bulgaria* : The areas sown in 1932 to permanent and temporary meadows are 776,000 acres and 82,000 acres respectively, exceeding those of 1931 by 3.0 % and 6.5 % respectively. The area sown to vetches is 383,000 acres against 343,000 in 1931. Frequent rains during the first half of May were very favourable to the growth of fodder crops.

*Estonia* : On 15 May the crop condition of clover was average. This crop was damaged by the ice which formed in January after the thaw and also by the April frosts.

*Irish Free State* : The weather during May was mainly unsettled with cold, harsh winds and some frost. The growth of vegetation was consequently checked and most crops were backwards at the close of the month. The supplies of last year's hay, grain and root crops still on hand in the first week of June were adequate for all normal requirements.

*France* : The first cuttings of fodder crops have yielded fairly satisfactory results. Throughout the Southwest, cutting has been hindered by persistent bad weather and quality is anticipated to be rather deficient. In the Paris basin and the West alfalfa field are infested with weeds and do not promise good crops whereas the clover crop is in general fairly good. On the whole, the condition of permanent meadows, although improved during May ; does not permit hopes of high yields; if quality of the grass is to be satisfactory, a period of sunny, warm weather will be required in the latter half of June. Fodder roots, on the contrary, appear to be in good condition ; beet have in general come up well and the young plants are fairly strong.

*Great Britain and Northern Ireland* : In England and Wales with the exception of a few fine days in the middle of the month and in Scotland save in the latter part of the month the weather during May was cold with considerable rain and some night frosts.

Seeds and meadow grass generally made progress during May but needed a spell of sunshine. An average though somewhat later crop of hay than usual may be expected. Pastures showed an improvement but were not so heavily stocked as usual. Due to the unfavourable weather, a considerable proportion of the root crops remained to be sown and cultivation was hindered. Early sown mangolds were in fair condition but the land in many cases was smothered in weeds.

In Northern Ireland cold, north-easterly winds were again frequent in May and night frosts occurred with the result that pastures remained backward. Grass, however, made satisfactory growth later in the month, particularly where top dressing with manures had been done. The first hay crop was retarded until the last week of the month when weather conditions and crop prospects were more favourable.

The wet period at the beginning of the month retarded the preparing of land for the sowing of mangolds but the brairds in most cases were looking well. Turnip sowing was well forward in most districts and crop generally had brairded well.

*Hungary:* Rains in the last week of May and the first week of June had a beneficial effect on all fodder crops.

Production from the first cutting of clover and alfalfa was average. Quality of the crop suffered due to rain at the time of cutting. Forecasts for the second cutting are promising. Mixed oats and vetches and maize for green fodder are growing well.

The first mowing of permanent meadows is in progress results are generally below the average. After the rains the vegetation recovered and was luxurious. Pastures are also beginning to grow better and provide sufficient feed for livestock.

*Italy:* During May the first mowing of meadows did not give very abundant yields but the second promised a heavy production. Mowing was hindered by the bad weather.

*Latvia:* Weather conditions in May were generally favourable to fodder crops, hastening their growth.

At the beginning of June, crop condition of clover according to correspondents' reports was average in 33.6% of the cases, above it in 57.9% and below it in 8.5%. Corresponding figures for permanent meadows are: 63.2%, 24.9% and 11.9%.

*Lithuania:* Weather conditions in May have favoured fodder production.

*Switzerland:* The permanent and temporary meadows in particular have made remarkable progress. A good hay crop may in general be anticipated despite the fact that yields will not quite equal those of the last two years. It is reported in some districts that on light lands the grass is a little thin; on other lands, the turf is strong and growth satisfactory. The pastures had been under snow for a rather prolonged period so that until now the grass has grown only weakly.

*Argentina:* The weather during May was generally favourable for the germination of fodder crops except in the Pampa territory where frosts have caused considerable damage. Towards the end of the month some complaints were beginning to be made of drought in the Provinces of Buenos Aires and Santa Fé.

*Canada* : Due to the cold, backward spring, condition of hay and pasture crops on 1 June was the lowest in many years. During the first nine days of June the weather throughout Canada was more favourable for the growth of crops and pastures with warmer weather and good rains general. According to a cable of 14 June from the Canadian Government, the pasture and hay crops will be reduced. In the following table are given the data of area and production of clover and grass seeds in 1931 compared with the corresponding figures for 1930 and the five-year averages.

*Area in acres.*

	1931	1930	average 1925 to 1929	% 1931 = 100	aver. = 100
Red clover . . . . .	22,600	12,400	18,500	181.9	121.9
Alsike . . . . .	16,500	25,000	40,000	66.1	41.3
Alfalfa . . . . .	17,200	31,600	17,500	54.6	98.4
Timothy . . . . .	...	...	17,200	...	...
Sweet clover . . . . .	17,000	18,500	18,100	92.0	93.9
Bluegrass . . . . .	...	...	9,000	...	...
Bentgrass . . . . .	...	500	680	...	...

*Production of seed.*

Red clover	(centals) . . . . .	39,800	17,300	22,000	230.4	180.8
	(sh. tons) . . . . .	1,990	860	1,100	...	...
Alsike	(centals) . . . . .	49,600	37,500	99,800	132.1	49.7
	(sh. tons) . . . . .	2,480	1,880	4,990	...	...
Alfalfa	(centals) . . . . .	50,800	44,800	35,000	113.3	145.2
	(sh. tons) . . . . .	2,540	2,240	1,750		
Timothy	(centals) . . . . .	20,000	20,000	34,300	100.0	58.4
	(sh. tons) . . . . .	1,000	1,000	1,700		
Sweet clover	(centals) . . . . .	63,500	50,000	55,600	127.0	114.2
	(sh. tons) . . . . .	3,180	2,500	2,780		
Bluegrass	(centals) . . . . .	8,000	15,000	2,790	53.3	286.7
	(sh. tons) . . . . .	400	750	140		
Bentgrass	(centals) . . . . .	150	400	440	37.6	34.3
	(sh. tons) . . . . .	7	20	22		

Production of clover and grass seeds made quite a good recovery in 1931 from the comparatively low level of the previous year; in fact in some cases, notably alsike and alfalfa, a larger production was obtained from a smaller acreage. Production was also above the five-year average except in the case of alsike, which was much below it, timothy and bentgrass. Both acreage and production of red clover seed showed a sharp increase on the low level of the preceding year.

On 21 June pastures had greatly improved.

*United States*: In the week ended on 2 June the continued absence of rain was detrimental to pastures in central parts of the country, with condition of many poor. Outside this dry area, however, pastures were mostly satisfactory. In the northern Great Plains improvement continued while in the great western grazing area pastures and ranges were in good to excellent condition rather generally.

*Algeria*: Pasture grass is still fairly plentiful but in some districts has begun to dry up; the rains at the middle of May in some places were too late to bring about a lasting improvement. In the South, the poor production of fodder and straw will not permit the retention of normal reserves.

*Egypt*: During May weather has been favourable to growth and maturation of bersim. The last cutting is being taken. Crop condition on 1 June was 101, as against 100 on 1 May and on 1 June 1931.

*French Morocco*: Fodder crops have been housed under good conditions. The pastures still have a good stand of grass thanks to the damp nights and morning dews.

## LIVESTOCK AND DERIVATIVES

### Livestock in Kingdom of Yugoslavia.

According to recent data of the Ministry of Agriculture, the numbers of livestock in the Kingdom in 1931, compared with the corresponding figures for the preceding seven years, are as follows:

YEAR (1)	Cattle	Horses	Asses	Mules	Sheep	Goats	Pigs	Buffaloes
1931 . . . . .	3,871,556	1,168,768	115,270	16,359	8,425,634	1,928,224	3,133,164	40,563
1930 . . . . .	3,812,172	1,161,235	106,944	15,843	7,953,139	1,731,430	2,923,862	37,437
1929 . . . . .	3,723,083	1,140,843	106,117	15,469	7,735,957	1,808,574	2,674,800	36,846
1928 . . . . .	3,664,261	1,109,246	103,523	15,165	7,722,247	1,750,006	2,662,790	32,116
1927 . . . . .	3,729,343	1,120,310	97,509	14,865	7,735,915	1,738,958	2,769,848	30,980
1926 . . . . .	3,706,019	1,116,858	96,298	14,551	7,932,845	1,721,233	2,306,182	31,519
1925 . . . . .	3,768,135	1,106,142	95,236	14,504	7,906,808	1,810,669	2,302,355	27,431
1924 . . . . .	3,734,267	1,058,875	89,779	14,190	7,618,708	1,715,368	2,517,955	23,626
1923 . . . . .	3,869,985	1,062,396	94,720	14,349	7,689,287	1,730,204	2,496,723	31,717
1922 . . . . .	4,058,419	1,043,523	86,036	15,002	8,461,504	1,801,409	2,387,020	31,938

(1) At end of year.

Despite the smaller fodder crop (especially of meadow hay) in 1931 compared with the preceding year, the figures show new increases in all kinds of livestock at the end

of 1931. In fact, at this date the number of livestock, excluding cattle and sheep, was larger than in 1922, which was a record year for livestock in Yugoslavia.

This increase in livestock numbers may be explained, on the one hand, by improvements made in livestock rearing following a series measures for this purpose (law of 21 December 1929 for the improvement of the various breeds of livestock, for the better organisation of the industry and the export trade, etc.). The increase in livestock in 1931 was also contributed to by the reduction in exports of livestock and livestock products in 1931, which, in its turn, was caused by the fall in prices and by import restrictions imposed by the principal importing countries. According to the index-numbers of the National Bank of Yugoslavia wholesale prices of livestock products fell from 84.9 in January 1931 to 73.4 in December 1931 (1926 = 100) and according to the official statistics the export during 1931 compared with 1930 has decreased by 114,831 head of small animals and by 29,866 of live horned cattle etc.

## IMPORT DUTIES ON CEREALS AND FLOUR

### CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGES 160 TO 163 OF THE CROP REPORT FOR FEBRUARY  
(SEE ALSO THE SAME HEADING IN THE PRECEDING CROP REPORTS FOR THIS YEAR).

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Spain. . . . .	Wheat (1) . . . . .	1 May	pes. 5.50	28.88
" . . . . .	Maize . . . . .	28 May	" 7.00	34.31
Estonia . . . . .	Maize . . . . .	2 June	Est. crs. 20.00	134.28
Greece . . . . .	Cereals and flour of cereals . . . . .	20 May	(2)	(2)
Portugal . . . . .	Wheat, imported at Lissabon . . . . .	17 May (3)	esc. 72.00	65.38
" . . . . .	" " Oporto . . . . .		" 70.00	63.54
Switzerland . . . . .	Brewers' barley, supplementary duty . . . . .	18 March	Sw. frs. 15.50	65.11
" . . . . .	Wheat, rye, barley, oats, maize . . . . .	12 May	(4)	(4)
Czechoslovakia . . . . .	Rye, supplementary duty . . . . .	29 April	Cz. crs. 24.00	18.13

(1) Import permitted under special authorisation for each shipment. The total quantity importable, originally fixed at 500,000 quintals (see Crop Report for April, p. 297), has been raised to 1,000,000 quintals and more recently the import of a further quota of 1,000,000 quintals before 300 June has been authorised. The import duty is fixed every ten days. All the modifications cannot be published here. — (2) The import duties expressed in gold drachmai do not change; payments are made in paper drachmai, of which the total for the above products is fixed at fifteen times the amount in gold drachmai (according to the exchange rate on 1 June one gold drachme equals 29.24 paper drachmai). — (3) Import authorised up to 350,000 quintals before the end of June. — (4) Import of normal quantities and by regular importers remains provisionally free. From 1 July these commodities may be imported only under special licence, to be given only for imports originating in countries importing Swiss products of a value at least equal to their exports to Switzerland.

## TRADE

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	456	434	0	0	5,115	1,550	0	0	3,234	0
Hungary . . . . .	212	66	0	0	6,912	4,674	0	0	5,247	0
Lithuania . . . . .	2	66	0	0	20	536	0	0	545	0
Poland . . . . .	351	172	4	4	1,041	1,501	333	44	1,847	49
Rumania . . . . .	...	...	...	...	(1) 19,903 (1)	6,775 (1)	4 (1)	7	9,054	9
U. S. S. R. . . . .	...	...	...	...	(2) 37,426 (2)	50,067	—	—	67,735	—
Yugoslavia . . . . .	772	71	0	0	8,027	2,833	0	0	3,247	0
Canada . . . . .	4,508	2,809	2	4	79,071	99,764	60	53	137,150	79
United States . . . . .	5,613	2,127	476	1,067	42,256	29,890	5,336	9,182	46,253	11,616
Argentina . . . . .	11,491	10,338	—	—	65,403	45,193	—	—	71,725	—
Chile . . . . .	2	0	0	0	7	425	0	0	428	0
Turkey . . . . .	106	18	0	0	752	108	0	7	265	7
Algeria . . . . .	...	...	...	...	(3) 2,232 (3)	6,102 (3)	988 (3)	320	6,310	1,371
Tunis . . . . .	240	55	35	126	2,075	1,356	355	410	3,704	542
Australia . . . . .	7,785	10,789	0	0	55,427	53,204	0	0	76,505	0
<i>Importing Countries:</i>										
Germany . . . . .	110	0	908	1,008	7,282	265	12,227	12,346	265	18,805
Austria . . . . .	0	0	397	470	0	34	4,969	3,430	86	5,315
Belgium . . . . .	265	185	2,542	2,948	3,049	897	22,434	22,020	2,079	31,184
Denmark . . . . .	0	13	370	379	9	33	7,061	3,012	46	4,877
Spain . . . . .	0	0	0	0	0	4	35	0	4	0
Estonia . . . . .	0	0	35	11	0	0	216	232	0	370
Irish Free State . . . . .	...	...	...	...	(1) 7 (1)	18 (1)	4,359 (1)	4,782	18	6,435
Finland . . . . .	0	0	24	11	0	0	289	64	0	90
France . . . . .	0	0	6,144	4,805	9	966	34,776	23,409	966	46,597
Gr. Brit. and N. Ir. . . . .	187	49	10,450	9,154	644	562	105,765	98,496	683	124,551
Greece . . . . .	0	0	1,202	1,318	0	0	10,690	9,980	0	14,233
Italy . . . . .	0	0	3,638	4,661	18	22	12,306	36,634	22	50,122
Latvia . . . . .	0	0	20	55	0	0	366	682	0	1,030
Norway . . . . .	0	0	340	238	0	0	2,789	2,498	0	3,123
Netherlands . . . . .	4	15	1,293	1,695	97	637	12,489	13,402	683	10,568
Portugal . . . . .	—	—	15	35	—	—	516	207	—	1,316
Sweden . . . . .	2	2	408	187	7	31	2,974	2,414	31	2,879
Switzerland . . . . .	0	0	911	688	11	2	9,366	8,644	2	11,036
Czechoslovakia . . . . .	0	0	994	300	4	4	10,102	4,985	4	7,079
British India . . . . .	4	4	0	756	174	1,922	179	5,130	2,251	6,687
Japan . . . . .	—	—	1,706	2,008	—	—	12,114	10,406	—	15,311
Syria and Lebanon . . . . .	24	9	62	2	481	115	97	37	137	44
Egypt . . . . .	...	...	...	...	(3) 0 (3)	2 (3)	478 (3)	507	2	1,019
Union of South Africa . . . . .	...	...	...	...	(1) 0 (1)	0 (1)	847 (1)	1,188	0	1,601
New Zealand . . . . .	...	...	...	...	(2) 0 (2)	0 (2)	64 (2)	93	0	128
<b>Totals . . . . .</b>	<b>32,134</b>	<b>27,302</b>	<b>31,944</b>	<b>31,736</b>	<b>337,509</b>	<b>369,641</b>	<b>275,584</b>	<b>274,360</b>	<b>441,028</b>	<b>384,136</b>
<b>Rye. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	9	2	2,205	37	2,026	1,213	6,050	553	1,213	690
Bulgaria . . . . .	29	201	0	0	981	1,160	0	0	1,413	0
Hungary . . . . .	101	99	0	0	1,118	1,493	0	0	1,579	0
Lithuania . . . . .	0	4	0	0	0	150	2	0	168	0
Poland . . . . .	179	423	0	0	2,068	5,487	123	0	5,880	2
Rumania . . . . .	...	...	...	...	(1) 1,493 (1)	800 (1)	0 (1)	0	1,299	0
U. S. S. R. . . . .	...	...	...	...	(2) 17,910 (2)	9,262	—	—	15,794	—
Canada . . . . .	168	0	0	0	2,105	666	0	0	1,171	0
United States . . . . .	157	0	—	—	187	73	—	—	60	—
Argentina . . . . .	1,847	90	—	—	4,522	443	—	—	992	—
Turkey . . . . .	106	35	0	0	628	317	0	0	368	0
Algeria . . . . .	...	...	...	...	(3) 11 (3)	26 (3)	0 (3)	0	35	0
<i>Importing Countries:</i>										
Austria . . . . .	0	0	101	309	0	9	1,109	1,550	9	2,205
Belgium . . . . .	90	11	139	437	388	77	1,632	2,337	126	3,739
Denmark . . . . .	0	0	295	575	0	0	3,591	5,562	4	7,103
Estonia . . . . .	0	0	0	31	0	0	7	117	0	194
Finland . . . . .	0	0	139	46	0	0	470	1,276	2	1,570
France . . . . .	0	0	99	152	0	0	1,299	1,045	0	1,575
Italy . . . . .	0	0	26	77	0	0	117	476	0	597
Latvia . . . . .	0	0	11	29	0	0	86	231	0	280
Norway . . . . .	0	0	323	119	0	0	2,923	2,438	0	3,023
Netherlands . . . . .	7	163	141	428	232	454	3,135	4,550	791	6,436
Sweden . . . . .	15	2	90	24	15	2	941	456	4	520
Switzerland . . . . .	0	0	12	15	0	0	71	143	0	174
Czechoslovakia . . . . .	0	7	137	2	7	470	4,502	1,117	476	244
<b>Totals . . . . .</b>	<b>2,796</b>	<b>1,937</b>	<b>3,723</b>	<b>3,281</b>	<b>33,741</b>	<b>23,897</b>	<b>35,493</b>	<b>31,151</b>	<b>31,409</b>	<b>23,479</b>

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Wheat flour. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany	7	4	11	11	60	121	163	159	128	238
Belgium	7	13	0	31	53	139	42	207	216	231
Bulgaria	60	31	0	0	600	123	0	0	220	0
Spain	0	7	0	0	15	51	0	0	75	0
France	265	829	18	51	4,019	4,978	187	474	7,423	569
Hungary	132	190	0	0	1,832	3,338	0	0	4,008	0
Italy	134	79	22	22	1,755	963	229	141	1,191	223
Latvia	0	4	0	0	0	71	0	2	73	2
Lithuania	2	2	0	0	22	18	0	0	24	0
Poland	24	40	0	4	459	547	4	20	615	24
Rumania	...	...	...	...	(1) 820	(1) 331	(1) 0	(1) 0	421	0
Yugoslavia	15	4	0	0	73	64	0	2	88	2
Canada	500	639	0	2	7,652	10,243	31	37	13,113	49
United States	1,056	1,490	0	0	12,932	18,034	0	2	23,164	2
Argentina	112	165	—	—	1,113	1,549	—	—	2,065	—
Chile	2	2	0	0	15	97	0	0	104	0
India	60	90	0	0	681	787	0	2	1,032	2
Turkey	7	0	0	0	9	29	4	11	29	11
Japan	359	558	9	13	2,238	2,780	93	133	3,472	212
Algeria	...	...	...	...	(3) 64	(3) 212	(3) 44	(3) 26	267	57
Tunis	15	13	2	0	97	196	18	9	281	11
Australia	1,164	988	0	0	10,959	7,685	0	0	10,404	0
<i>Importing Countries:</i>										
Austria	0	0	106	249	7	4	917	1,389	13	3,100
Denmark	2	2	86	123	9	18	1,058	1,252	24	1,772
Estonia	2	0	0	2	11	0	15	77	2	88
Irish Free State	...	...	...	...	(1) 22	(1) 20	(1) 2,504	(1) 2,445	40	3,691
Finland	0	0	79	101	0	0	1,241	1,663	0	2,150
Gr. Britain and N. Ir.	530	344	699	1,096	4,151	3,450	8,686	9,550	4,005	12,816
Greece	0	0	4	9	0	0	57	139	0	165
Norway	0	0	90	75	9	2	1 14	913	2	1,396
Netherlands	2	11	5	192	64	95	384	2,712	115	3,345
Portugal	—	—	7	22	—	—	110	150	—	213
Sweden	0	0	2	4	0	2	31	60	2	71
Czechoslovakia	2	0	93	7	7	11	882	2,394	11	2,432
Ceylon	—	—	26	33	—	—	331	340	—	445
Java and Madura	—	—	...	...	—	—	(1) 783	(1) 653	—	1,025
Indo-China	—	—	31	31	—	—	304	316	—	423
Syria and Lebanon	2	0	53	9	88	9	293	115	22	168
Egypt	...	...	...	...	(3) 0	(3) 0	(3) 1,666	(3) 2,143	0	3,580
Union of South Africa	...	...	...	...	(1) 2	(1) 9	(1) 11	(1) 229	11	266
New Zealand	...	...	...	...	(1) 2	(1) 2	(1) 148	(1) 139	2	234
<b>Totals</b>	<b>4,511</b>	<b>5,511</b>	<b>1,391</b>	<b>2,087</b>	<b>49,540</b>	<b>56,001</b>	<b>21,576</b>	<b>28,474</b>	<b>73,225</b>	<b>39,373</b>
<b>Barley. — Thousand cents (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria	2	146	0	0	390	1,477	0	0	1,598	0
Spain	0	2	0	0	9	132	0	0	152	0
Hungary	2	7	0	2	49	504	7	2	580	4
Lithuania	0	0	0	0	0	13	0	0	15	0
Poland	05	112	0	0	3,007	2,760	0	0	2,798	0
Rumania	...	...	...	...	(1) 13,305	(1) 28,541	(1) 0	(1) 0	33,797	4
Czechoslovakia	287	64	0	0	1,411	2,974	2	2	3,003	4
U. S. S. R.	...	...	...	...	(2) 15,115	(2) 17,249	—	—	23,385	—
Canada	295	362	0	0	4,376	1,975	0	0	9,240	0
United States	90	346	—	—	1,612	3,960	—	—	5,022	—
Argentina	571	908	—	—	6,010	4,451	—	—	5,701	—
Chile	86	13	0	0	428	386	0	0	586	0
India	77	0	0	0	375	4	0	0	306	2
Syria and Lebanon	4	104	0	0	373	600	79	4	869	7
Turkey	203	33	0	0	2,628	342	0	0	593	0
Algeria	...	...	...	...	(3) 582	(3) 1,222	(3) 1,956	(3) 60	1,444	466
Egypt	...	...	...	...	(3) 0	(3) 2	(3) 256	(3) 57	2	152
Tunis	...	...	...	...	126	168	551	366	220	390
Australia	73	104	0	0	1,429	1,272	0	0	1,562	0
<i>Importing Countries:</i>										
Germany	0	0	2,392	1,592	18	62	11,823	12,918	62	17,941
Austria	0	0	134	163	0	0	1,731	1,552	0	2,077
Belgium	181	194	620	1,163	1,332	686	7,923	8,675	1,076	10,638
Denmark	24	63	117	774	437	1,177	2,433	11,524	1,382	15,093
Estonia	0	0	0	0	0	0	0	13	0	13
Irish Free State	...	...	...	...	(1) 26	(1) 20	(1) 304	(1) 267	20	454
France	0	7	631	928	15	22	7,366	5,825	22	7,721
Gr. Britain and N. Ir.	0	2	714	983	9	57	12,238	15,600	68	13,681
Greece	0	0	7	0	0	0	159	75	0	73
Italy	0	0	97	60	0	0	666	635	0	773
Netherlands	0	0	0	20	0	0	4	196	0	212
Portugal	0	0	110	11	0	0	701	767	0	1,075
Sweden	0	0	633	1,074	239	516	7,494	11,656	591	14,716
Czechoslovakia	24	106	0	179	0	0	2,421	3,250	0	2,520
Yugoslavia	0	0	0	0	13	13	37	180	20	180
<b>Totals</b>	<b>2,136</b>	<b>2,697</b>	<b>3,511</b>	<b>7,043</b>	<b>53,362</b>	<b>70,650</b>	<b>58,156</b>	<b>73,601</b>	<b>33,975</b>	<b>50,520</b>



COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Oats. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Germany . . . . .	2	2	11	139	9	216	192	556	220	1,005
Irish Free State . . . . .	...	...	...	...	(x) 82	(x) 227	(x) 192	(x) 201	254	452
Hungary . . . . .	0	0	0	33	4	13	2	68	13	141
Lithuania . . . . .	0	2	0	0	13	82	0	0	84	0
Poland . . . . .	9	11	0	0	35	121	0	0	137	0
Rumania . . . . .	...	...	...	...	(x) 209	(x) 1,391	(x) 0	(x) 0	1,779	0
Czechoslovakia . . . . .	104	9	0	2	525	710	55	9	710	143
U. S. S. R. . . . .	...	...	...	...	...	...	...	...	10,726	...
Canada . . . . .	595	53	0	0	3,479	893	536	234	2	86
United States . . . . .	13	4	2	7	670	97	18	141	2,659	234
Argentina . . . . .	1,914	1,832	...	...	12,683	10,774	...	...	130	198
Chile . . . . .	0	335	0	0	137	1,510	0	0	15,062	...
Algeria . . . . .	...	...	...	...	(3) 194	(3) 809	(3) 311	(3) 180	2,178	0
Tunis . . . . .	4	49	0	0	141	470	0	9	1,292	225
Australia . . . . .	4	7	0	0	66	62	2	0	545	9
<i>Importing Countries:</i>										
Austria . . . . .	0	0	150	150	0	2	1,109	1,488	2	2,227
Belgium . . . . .	11	0	214	130	22	2	988	2,712	2	3,494
Denmark . . . . .	0	2	44	254	66	20	346	913	20	1,270
Estonia . . . . .	0	0	0	35	0	0	7	87	0	159
Finland . . . . .	0	0	0	44	20	7	40	123	7	280
France . . . . .	0	4	615	185	7	18	1,728	1,475	20	2,200
Gr. Brit. and N. Irel. . . . .	9	106	584	529	201	337	6,047	7,864	397	10,697
Italy . . . . .	0	0	503	434	0	0	3,071	3,232	0	3,741
Latvia . . . . .	0	0	0	22	0	4	7	53	4	57
Norway . . . . .	0	0	18	2	2	4	238	4	4	4
Netherlands . . . . .	2	71	243	245	42	342	1,823	2,665	375	3,609
Sweden . . . . .	31	7	123	209	73	40	970	855	40	1,334
Switzerland . . . . .	0	0	597	463	0	0	3,781	3,682	2	4,564
Yugoslavia . . . . .	0	0	0	4	0	2	0	84	7	2
<b>Totals . . . . .</b>	<b>2,698</b>	<b>2,494</b>	<b>3,109</b>	<b>2,897</b>	<b>18,660</b>	<b>18,153</b>	<b>21,458</b>	<b>26,595</b>	<b>36,737</b>	<b>36,126</b>

**Maize. — Thousand centals (1 cental = 100 lbs).**

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<b>Maize. — Thousand centals (1 cental = 100 lbs).</b>										
<i>Exporting Countries:</i>										
Bulgaria . . . . .	478	646	0	0	1,828	2,427	0	0	3,477	0
Rumania . . . . .	...	...	...	...	(x) 18,189	(x) 7,791	(x) 0	(x) 0	18,938	2
Yugoslavia . . . . .	225	950	0	0	1,318	4,958	24	7	6,420	24
United States . . . . .	260	84	20	18	868	697	141	406	1,314	520
Argentina . . . . .	17,337	14,890	...	...	88,412	68,066	...	...	198,983	...
Brazil . . . . .	...	...	...	...	(x) 0	(x) 11	...	...	18	...
Java and Madura . . . . .	...	...	...	...	(x) 1,468	(x) 869	...	...	2,407	...
Indo-China . . . . .	192	0	...	...	1,272	1,526	...	...	2,584	...
Syria and Lebanon . . . . .	0	29	4	11	7	139	11	35	159	49
Turkey . . . . .	37	35	0	0	141	44	0	0	212	0
Egypt . . . . .	...	...	...	...	(3) 4	(3) 2	(3) 18	(3) 22	4	298
Union of South Africa . . . . .	...	...	...	...	(x) 1,411	(x) 1,021	(x) 0	(x) 0	3,298	0
<i>Importing Countries:</i>										
Germany . . . . .	0	0	2,202	911	0	0	8,109	3,783	0	10,007
Austria . . . . .	0	0	595	509	0	0	3,790	2,513	2	6,270
Belgium . . . . .	181	106	979	974	839	866	9,475	7,004	955	17,075
Denmark . . . . .	0	0	1,673	523	0	0	10,752	4,034	0	18,539
Spain . . . . .	0	0	474	421	0	0	3,900	2,079	0	3,656
Irish Free State . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 5,353	(x) 3,898	28	12,044
Finland . . . . .	0	0	51	18	0	0	288	104	0	855
France . . . . .	7	7	1,404	1,451	20	33	11,841	10,150	40	22,755
Gr. Brit. and N. Ir. . . . .	280	134	2,427	2,819	1,455	1,148	33,277	23,900	2,407	58,281
Greece . . . . .	0	0	575	49	0	0	3,053	101	0	373
Hungary . . . . .	9	18	0	802	60	212	245	780	240	2,397
Italy . . . . .	2	2	1,498	1,345	4	4	7,229	6,988	7	17,447
Norway . . . . .	...	...	278	239	...	...	2,070	1,907	0	3,977
Netherlands . . . . .	40	15	2,167	1,894	139	174	21,378	14,952	273	32,441
Poland . . . . .	0	0	7	29	0	0	57	126	0	436
Portugal . . . . .	...	...	93	64	...	...	549	1,096	...	1,606
Sweden . . . . .	0	0	406	584	0	0	3,514	3,025	0	7,311
Switzerland . . . . .	0	0	159	201	0	0	1,375	1,631	2	3,611
Czechoslovakia . . . . .	0	0	1,148	1,232	0	0	6,907	5,247	2	13,115
Canada . . . . .	0	0	58	187	4	4	2,313	2,141	9	4,769
Japan . . . . .	...	...	218	216	...	...	1,274	704	...	1,639
Tunis . . . . .	0	2	18	85	0	0	35	240	0	283
<b>Totals . . . . .</b>	<b>19,049</b>	<b>16,915</b>	<b>16,459</b>	<b>15,554</b>	<b>115,491</b>	<b>89,498</b>	<b>137,411</b>	<b>95,547</b>	<b>241,436</b>	<b>236,245</b>

COUNTRIES	APRIL				FOUR MONTHS (January 1-April 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1932	1931	1932	1931	1931	1931
<b>Rice. — Thousand centals (1 cental = 100 lbs.)</b>										
<i>Exporting Countries:</i>										
Spain . . . . .	42	64	0	0	379	209	0	0	893	0
Italy . . . . .	203	254	9	11	1,360	1,327	20	13	3,106	53
United States . . . . .	362	205	26	49	981	1,054	104	176	2,771	328
Brazil . . . . .	...	...	—	—	(x) 130	(1) 159	—	—	1,903	—
India . . . . .	5,307	5,620	11	24	22,853	13,435	97	95	48,442	692
Indo-China . . . . .	1,984	2,247	—	—	9,116	6,980	—	—	21,153	—
Siam . . . . .	3,572	2,363	—	—	11,579	8,946	—	—	24,818	—
Egypt . . . . .	...	...	...	...	(3) 37	(3) 198	(3) 194	(3) 15	666	886
<i>Importing Countries:</i>										
Germany . . . . .	95	77	666	642	298	245	2,103	1,391	1,373	8,962
Austria . . . . .	0	0	31	60	0	0	152	212	0	756
Belgium . . . . .	22	11	132	128	93	49	379	359	190	1,349
Denmark . . . . .	0	0	11	9	0	0	35	46	0	157
Estonia . . . . .	—	—	2	2	—	—	7	9	—	33
Irish Free State . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 11	(x) 15	0	53
France . . . . .	84	121	780	522	273	322	2,137	1,619	937	6,792
Gr. Brit. and N. Irel. . . . .	18	20	317	223	84	75	988	741	271	2,690
Greece . . . . .	—	—	46	51	—	—	190	179	—	540
Hungary . . . . .	0	0	24	62	0	0	119	143	2	481
Latvia . . . . .	0	0	2	2	0	0	4	29	0	82
Lithuania . . . . .	0	0	0	0	0	0	4	9	0	22
Norway . . . . .	0	0	4	20	0	0	18	44	0	117
Netherlands . . . . .	134	192	798	421	564	2,057	979	840	2,480	4,963
Poland . . . . .	29	13	207	7	99	35	183	11	606	1,726
Portugal . . . . .	—	—	161	71	—	—	370	163	—	613
Sweden . . . . .	—	—	0	0	—	—	0	0	—	123
Switzerland . . . . .	0	0	33	37	0	0	134	141	0	454
Czechoslovakia . . . . .	0	0	93	62	0	0	273	203	0	1,127
Yugoslavia . . . . .	0	0	37	40	2	2	170	154	4	511
Canada . . . . .	0	0	33	55	0	0	218	273	0	710
Chile . . . . .	—	—	22	37	—	—	117	174	—	441
Ceylon . . . . .	0	0	642	833	2	4	3,376	3,622	13	10,196
Java and Madura . . . . .	...	...	...	...	(x) 11	(x) 37	(x) 1,715	(x) 2,207	232	6,327
Japan . . . . .	7	527	247	253	24	1,618	325	773	4,195	2,773
Syria and Lebanon . . . . .	0	0	40	15	0	0	126	71	0	822
Turkey . . . . .	0	0	7	13	0	0	22	53	0	185
Algeria . . . . .	...	...	...	...	(3) 0	(3) 0	(3) 29	(3) 20	2	179
Tunis . . . . .	0	0	4	4	0	0	24	11	0	31
Union of S. Africa . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 185	(x) 196	0	1,025
Australia . . . . .	9	22	13	2	37	53	26	15	161	29
New Zealand . . . . .	...	...	...	...	(x) 0	(x) 0	(x) 15	(x) 13	0	73
<b>Totals . . . . .</b>	<b>11,868</b>	<b>11,736</b>	<b>4,398</b>	<b>3,660</b>	<b>47,922</b>	<b>41,865</b>	<b>15,904</b>	<b>13,950</b>	<b>114,273</b>	<b>55,749</b>

*Exporting Countries:*

Estonia . . . . .	0	0	0	0	2	2	0	0	4	0
Lithuania . . . . .	13	9	0	0	93	112	0	0	247	0
Argentina . . . . .	3,245	3,567	—	—	17,699	17,679	—	—	41,454	—
India . . . . .	164	284	0	0	613	564	0	0	2,515	0
Tunis . . . . .	0	0	0	0	4	0	0	0	4	0

*Importing Countries:*

Germany . . . . .	13	0	1,049	1,292	4	4	2,890	3,375	13	7,507
Belgium . . . . .	13	13	353	293	101	31	1,387	1,318	205	3,702
Denmark . . . . .	—	—	68	64	—	—	174	161	—	417
Spain . . . . .	—	—	71	58	—	—	152	150	—	465
Finland . . . . .	0	0	4	4	0	0	20	29	0	68
France . . . . .	2	2	765	569	2	11	1,750	1,609	18	5,679
Gr. Brit. and N. Irel. . . . .	0	0	780	719	2	2	2,930	2,937	4	7,599
Greece . . . . .	0	0	7	4	0	0	18	24	0	95
Hungary . . . . .	2	2	0	0	4	4	0	2	42	2
Italy . . . . .	0	0	121	130	0	0	494	375	0	1,851
Latvia . . . . .	2	7	0	7	18	44	31	24	108	90
Norway . . . . .	0	0	66	33	0	0	143	168	0	289
Netherlands . . . . .	2	11	690	1,398	64	33	3,498	3,587	49	9,253
Poland . . . . .	0	0	4	60	2	4	33	93	7	273
Sweden . . . . .	—	—	154	104	—	—	375	342	—	1,056
Czechoslovakia . . . . .	0	0	66	75	2	2	143	146	7	532
Yugoslavia . . . . .	0	0	11	2	0	0	11	46	0	126
Canada . . . . .	0	0	11	0	2	2	33	0	584	194
United States . . . . .	—	—	869	463	—	—	2,306	1,929	—	6,149
Japan . . . . .	0	0	18	22	—	—	99	68	—	135
Australia . . . . .	0	0	9	20	0	0	203	103	0	231
<b>Totals . . . . .</b>	<b>3,433</b>	<b>3,895</b>	<b>5,116</b>	<b>5,312</b>	<b>18,612</b>	<b>18,464</b>	<b>16,600</b>	<b>16,546</b>	<b>45,259</b>	<b>45,332</b>

**Linseed. — Thousand centals (1 cental = 100 lbs.)**

(1) (3) See notes page 428.

COUNTRIES	APRIL				FOUR MONTHS (January 1-April 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1932	1931	1932	1931	1931	1931
<b>Butter. — (Thousand lbs)</b>										
<i>Exporting Countries:</i>										
Austria . . . . .	0	75	119	84	238	1,153	148	110	2,862	1,565
Denmark . . . . .	31,700	34,181	236	216	114,359	120,869	608	412	378,429	1,596
Estonia . . . . .	2,075	1,859	0	0	5,218	5,734	0	0	31,844	0
Irish Free State . . . . .	...	...	...	...	(1) 692	(1) 750	(1) 1,065	(1) 3,067	42,807	3,325
Finland . . . . .	4,266	4,546	0	0	13,466	14,341	0	0	38,367	0
Hungary . . . . .	60	60	0	0	1,131	540	0	0	4,065	117
Latvia . . . . .	3,472	2,714	0	4	9,270	8,889	0	13	41,313	24
Lithuania . . . . .	1,175	1,098	0	0	2,912	3,131	0	0	19,191	0
Netherlands . . . . .	3,527	7,657	536	207	11,958	22,946	7,564	2,000	72,660	8,887
Poland . . . . .	243	1,808	0	0	1,501	6,821	9	2	27,470	31
Sweden . . . . .	2,017	3,695	0	0	10,723	16,652	11	2	43,162	40
U. S. S. R. . . . .	...	...	—	—	...	...	—	—	68,024	—
Argentina . . . . .	5,701	4,352	—	—	26,912	24,868	—	—	51,187	—
India . . . . .	26	22	31	22	106	148	152	95	364	344
Syria and Lebanon . . . . .	26	18	168	97	130	487	591	117	1,817	344
Australia . . . . .	13,199	16,630	0	0	76,948	71,887	0	0	208,924	0
New Zealand . . . . .	24,610	11,023	—	—	87,085	82,830	—	—	220,814	—
<i>Importing Countries:</i>										
Germany . . . . .	86	24	9,645	16,001	126	99	54,362	65,440	269	220,950
Belgium . . . . .	291	216	7,031	2,760	743	776	24,438	13,067	2,756	41,562
Spain . . . . .	2	11	2	2	20	33	24	15	88	121
France . . . . .	342	650	5,128	6,759	2,156	3,038	12,322	23,722	11,086	40,886
Gr. Brit. and N. Irel. . . . .	1,653	3,086	67,080	75,193	26,169	19,804	301,730	280,727	40,228	903,967
Greece . . . . .	—	—	84	88	—	—	597	390	—	2,001
Italy . . . . .	134	104	192	772	337	333	2,782	3,596	1,290	6,188
Norway . . . . .	478	216	4	7	1,062	763	13	64	1,629	379
Switzerland . . . . .	0	0	1,299	1,649	2	2	5,505	7,123	20	23,358
Czechoslovakia . . . . .	0	2	445	201	26	298	798	238	661	4,107
Canada . . . . .	71	40	7	498	481	314	163	2,595	10,681	2,822
United States . . . . .	115	233	172	95	505	829	514	403	2,006	1,881
Ceylon . . . . .	—	—	55	37	—	—	203	192	—	642
Java and Madura . . . . .	—	—	—	—	—	(1) 1,830	(1) 2,617	—	—	8,514
Japan . . . . .	—	—	7	18	—	—	51	97	—	231
Algeria . . . . .	...	...	...	...	(3) 11	(3) 13	(3) 774	(3) 582	73	4,380
Egypt . . . . .	...	...	...	...	(3) 120	(3) 2	(3) 161	(3) 433	77	2,041
Tunis . . . . .	0	0	108	73	0	0	410	306	9	930
<b>Totals . . . . .</b>	<b>95,269</b>	<b>94,325</b>	<b>92,399</b>	<b>104,792</b>	<b>395,013</b>	<b>408,239</b>	<b>417,325</b>	<b>407,475</b>	<b>1,323,605</b>	<b>1,281,252</b>
<b>Cheese. — (Thousand lbs)</b>										
<i>Exporting Countries:</i>										
Denmark . . . . .	608	670	11	49	3,360	2,859	62	229	9,381	604
Finland . . . . .	620	489	0	2	2,315	2,090	7	11	5,776	33
Italy . . . . .	5,904	8,095	699	917	22,115	27,849	2,363	2,987	89,032	10,119
Lithuania . . . . .	112	163	0	0	602	675	0	2	2,546	11
Norway . . . . .	203	146	15	53	1,074	633	88	218	2,840	562
Netherlands . . . . .	14,103	15,406	82	101	50,043	57,148	364	425	190,460	1,345
Poland . . . . .	44	218	40	60	417	950	159	240	2,684	761
Switzerland . . . . .	3,408	5,141	890	582	13,010	19,240	1,768	2,022	54,307	8,470
Czechoslovakia . . . . .	390	534	287	324	2,791	2,784	305	946	10,981	3,779
Yugoslavia . . . . .	64	132	13	22	589	935	68	84	4,198	243
Canada . . . . .	377	505	55	99	2,727	2,220	311	423	84,790	1,446
Australia . . . . .	340	977	0	2	2,769	2,531	2	9	7,405	24
New Zealand . . . . .	21,451	12,229	0	0	81,560	87,641	2	2	181,703	4
<i>Importing Countries:</i>										
Germany . . . . .	227	397	8,005	9,158	1,373	2,019	30,060	35,834	7,372	120,404
Austria . . . . .	232	448	481	697	472	1,521	1,537	1,852	6,232	5,932
Belgium . . . . .	44	62	3,212	3,686	201	240	13,181	15,077	814	49,000
Spain . . . . .	29	24	130	302	75	77	725	1,153	236	3,367
Irish Free State . . . . .	...	...	...	...	(1) 22	(1) 31	(1) 514	(1) 635	194	2,687
France . . . . .	2,798	2,608	3,053	6,380	11,078	12,211	15,450	24,970	33,239	83,081
Gr. Brit. and N. Irel. . . . .	584	514	22,802	27,188	2,410	2,963	110,238	115,488	7,946	323,091
Greece . . . . .	7	42	243	11	71	1,005	1,052	190	3,960	203
Hungary . . . . .	7	13	0	11	20	51	9	99	110	208
Portugal . . . . .	—	—	81	55	—	—	119	154	—	842
Sweden . . . . .	—	—	68	141	—	—	298	503	—	1,691
United States . . . . .	97	134	5,230	6,471	514	677	17,357	19,266	1,863	61,992
India . . . . .	0	0	88	46	0	0	262	326	7	686
Java and Madura . . . . .	—	—	—	—	—	(1) 267	(1) 318	—	—	1,658
Syria and Lebanon . . . . .	9	7	44	26	11	26	322	196	86	708
Algeria . . . . .	...	...	...	...	(3) 24	(3) 29	(3) 1,711	(3) 1,239	172	11,162
Egypt . . . . .	...	...	...	...	(3) 88	(3) 22	(3) 588	(3) 1,444	78	7,804
Tunis . . . . .	0	4	174	117	2	7	701	626	24	2,033
<b>Totals . . . . .</b>	<b>51,764</b>	<b>48,956</b>	<b>45,208</b>	<b>56,777</b>	<b>199,653</b>	<b>226,900</b>	<b>306,359</b>	<b>227,32</b>	<b>704,261</b>	<b>708,332</b>

(1) (3) See notes page 428.

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31

## Cotton. — Thousand centals (1 cental = 100 lbs.).

<i>Exporting Countries:</i>										
United States . . .	2,950	2,132	79	86	39,699	31,806	370	344	36,891	538
Argentina . . . . .	24	35	—	—	295	298	—	—	505	—
Brazil . . . . .	—	—	—	—	(1) 179	(1) 443	—	—	516	—
India . . . . .	379	1,230	62	227	5,657	11,834	899	1,164	14,881	1,876
Egypt . . . . .	—	—	—	—	(3) 4,987	(3) 4,015	(3) 0	(3) 0	6,669	0
<i>Importing Countries:</i>										
Germany . . . . .	123	130	979	714	1,283	1,292	6,755	6,715	1,706	8,442
Austria . . . . .	0	0	42	33	0	0	443	359	0	467
Belgium . . . . .	29	15	86	168	276	130	1,109	1,305	201	1,713
Denmark . . . . .	—	—	7	9	—	—	101	106	—	146
Spain . . . . .	2	2	218	159	20	20	1,786	1,702	24	2,268
Estonia . . . . .	0	0	9	4	0	0	55	64	0	84
Finland . . . . .	0	0	18	11	0	2	121	139	2	172
France . . . . .	31	44	608	699	403	412	2,092	6,867	549	8,135
Gr. Brit. and N. Irel.	53	20	1,003	708	322	340	9,846	8,986	481	10,959
Greece . . . . .	0	0	24	13	0	0	159	150	0	225
Hungary . . . . .	0	0	11	20	0	0	291	212	—	291
Italy . . . . .	0	0	364	324	0	2	3,128	2,937	2	3,821
Latvia . . . . .	0	0	2	4	0	0	40	51	0	62
Norway . . . . .	0	0	7	2	0	0	35	42	0	46
Netherlands . . . .	0	0	73	108	7	4	728	802	7	1,043
Poland . . . . .	2	2	83	130	20	15	783	1,107	24	1,444
Portugal . . . . .	—	—	40	35	—	—	293	271	—	333
Sweden . . . . .	—	—	53	31	—	—	439	335	—	467
Switzerland . . . .	0	0	40	42	4	0	410	487	7	608
Czechoslovakia . . .	11	11	194	194	108	119	1,605	1,870	154	2,368
Yugoslavia . . . . .	0	0	15	9	0	0	161	139	0	185
Canada . . . . .	—	—	64	64	—	—	765	838	—	1,025
Japan . . . . .	229	29	2,293	1,922	800	353	12,954	10,615	534	13,741
Algeria . . . . .	—	—	—	—	(3) 2	(3) 4	(3) 4	(3) 2	24	4
<b>Totals . . . . .</b>	<b>3,833</b>	<b>3,650</b>	<b>6,379</b>	<b>5,716</b>	<b>54,062</b>	<b>51,069</b>	<b>46,272</b>	<b>47,629</b>	<b>62,677</b>	<b>60,448</b>

## Wool. — (Thousand lbs.).

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
	1932	1931	1932	1931	1931-32	1930-31	1931-32	1930-31	1930-31	1930-31
<i>Exporting Countries:</i>										
Irish Free State . .	—	—	—	—	(1) 6,621	(1) 3,690	(1) 500	(1) 382	7,965	7,552
Hungary . . . . .	35	148	73	203	1,213	1,693	902	1,336	9,981	1,612
Argentina . . . . .	35,909	36,355	—	—	234,149	220,205	—	—	290,449	—
Chile . . . . .	7,901	1,404	—	—	23,215	18,927	—	—	4,266	—
India . . . . .	2,291	6,027	595	549	27,474	23,482	3,199	1,424	28,455	4,857
Syria and Lebanon .	101	42	73	972	2,522	4,612	507	2,745	41,806	3,944
Algeria . . . . .	—	—	—	—	(3) 3,309	(3) 9,544	(3) 721	(3) 443	9,315	1,371
Egypt . . . . .	—	—	—	—	(3) 833	(3) 1,093	(3) 0	(3) 2	10,235	2
Un. of S. Africa . .	—	—	—	—	(1) 201,265	(1) 213,924	(1) 0	(1) 33	2,752	2
Australia . . . . .	67,880	47,567	99	269	(1) 2,798	(1) 2,943	(1) 739	(1) 478	260,750	33
New Zealand . . . .	4,094	4,361	0	9	665,095	632,700	1,812	1,209	4,830	500
— (a) —	36,610	30,823	0	0	39,397	29,952	7	46	749,742	2,337
— (b) —	6,473	3,042	0	0	157,336	127,101	2	0	43,923	53
— (c) —	—	—	—	—	30,100	23,479	2	0	43,923	53
— (d) —	—	—	—	—	—	—	—	—	172,382	0
— (e) —	—	—	—	—	—	—	—	—	44,675	0
<i>Importing Countries:</i>										
Germany . . . . .	101	730	41,679	43,665	8,847	6,737	161,674	215,335	11,305	329,621
Austria . . . . .	496	1,281	3,047	3,924	7,207	8,860	21,590	20,448	13,153	30,552
Belgium . . . . .	2	11	1,960	1,451	57	190	7,760	9,749	254	14,264
Denmark . . . . .	—	—	—	—	(1) 6,169	(1) 7,163	(1) 60,685	(1) 68,216	10,311	138,485
Spain . . . . .	22	18	331	174	(1) 13,625	(1) 12,586	(1) 1,903	(1) 2,449	21,638	3,918
Finland . . . . .	238	133	2,202	1,470	137	64	3,025	2,456	93	3,501
France . . . . .	0	406	287	247	2,147	2,842	5,917	5,785	3,946	10,474
Gr. Britain and N. Ir.	3,508	5,661	53,641	60,010	84	425	1,728	1,676	465	2,328
Greece . . . . .	39,055	48,425	100,778	131,590	32,532	36,897	250,609	321,292	51,506	480,966
Italy . . . . .	4	35	104	262	218	1,634	1,872	392	3,025	96,622
Norway . . . . .	40	291	12,950	10,221	974	1,455	89,938	69,605	2,161	9,599
Netherlands . . . .	75	723	915	791	1,182	2,595	10,565	6,202	4,967	8,770
Poland . . . . .	51	73	161	163	529	454	1,579	1,204	725	1,607
Sweden . . . . .	115	317	708	924	1,345	1,517	5,141	7,306	2,394	8,770
Switzerland . . . .	33	78	613	527	379	247	5,150	4,656	388	7,134
Czechoslovakia . . .	137	276	3,999	4,921	1,409	1,841	18,356	22,121	2,810	38,258
Yugoslavia . . . . .	—	—	2,249	2,681	—	—	13,109	10,144	—	15,461
Canada . . . . .	11	42	1,803	1,967	364	220	12,592	13,029	366	13,822
United States . . . .	110	201	2,648	3,948	1,567	981	22,095	20,622	1,590	38,952
Japan . . . . .	2	0	139	697	88	24	2,112	6,557	24	7,908
Tunis . . . . .	90	53	346	1,404	4,034	1,149	4,838	8,300	2,271	12,917
— (a) —	112	227	4,187	21,257	734	1,010	75,707	99,585	2,824	158,337
— (b) —	2	9	24,515	16,843	87	11	137,236	93,278	13	142,252
— (c) —	13	44	11	29	82	148	267	468	461	800
<b>Totals . . . . .</b>	<b>205,461</b>	<b>189,436</b>	<b>269,113</b>	<b>311,168</b>	<b>1,680,460</b>	<b>1,602,148</b>	<b>1,542,780</b>	<b>1,607,556</b>	<b>2,138,157</b>	<b>2,403,722</b>

(a) = Wool, greasy; (b) = Wool, scoured.

(1) (3) See notes page 418.

COUNTRIES	APRIL		TEN MONTHS (July 1-April 30)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	APRIL		TEN MONTHS (July 1-April 30)		TWELVE MONTHS (July 1- June 30)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Coffee. (Thousand lbs.).</b>						<b>Tea. (Thousand lbs.).</b>					
<b>EXPORTS.</b>						<b>EXPORTS.</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries</i>					
Brazil . . . . .	...	...	1,571,480	1,751,067	2,385,736	Ceylon . . . . .	27,498	23,856	191,305	195,645	247,397
India . . . . .	4,533	3,651	15,300	20,446	23,490	India . . . . .	5,456	4,341	314,629	323,000	347,401
Java and Madura .	...	...	(x) 37,615	(x) 38,680	38,105	Java and Madura .	...	...	(x) 120,331	(x) 116,570	155,986
						Japan . . . . .	414	1,545	21,341	19,639	24,315
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany . . . . .	119	73	1,484	1,080	1,845	Belgium . . . . .	0	2	20	24	31
Belgium . . . . .	231	794	9,289	3,565	5,090	Irish Free State .	...	...	(x) 209	(x) 126	185
France . . . . .	2	0	15	60	60	France . . . . .	2	4	55	33	35
Netherlands . . . .	1,221	1,532	12,566	16,402	19,059	Gr. Brit. and N. Ir.	7,388	9,046	72,587	74,470	87,052
Portugal . . . . .	150	33	1,023	456	553	Netherlands . . . .	9	9	117	90	115
Switzerland . . . . .	66	57	586	289	399	United States . . .	42	35	445	412	476
Canada . . . . .	4	2	37	46	55	Syria and Lebanon .	2	0	7	13	18
United States . . . .	2,937	1,649	20,644	18,334	24,293	Algeria . . . . .	...	...	(3) 31	(3) 13	22
Ceylon . . . . .	0	2	11	225	227	Union of S. Africa .	...	...	(x) 112	(x) 51	66
Syria and Lebanon .	26	9	37	53	62	Australia . . . . .	31	33	476	725	851
Australia . . . . .	7	4	46	46	53	New Zealand . . . .	...	...	(x) 60	(x) 88	115
<b>Totals . . . . .</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2,498,537</b>	<b>Totals . . . . .</b>	<b>40,842</b>	<b>38,811</b>	<b>722,225</b>	<b>730,899</b>	<b>867,015</b>
<b>IMPORTS.</b>						<b>IMPORTS.</b>					
<i>Importing Countries:</i>						<i>Importing Countries</i>					
Germany . . . . .	29,542	37,034	267,042	301,003	350,362	Germany . . . . .	897	1,316	9,114	11,169	12,741
Austria . . . . .	1,433	1,841	13,655	17,271	23,268	Austria . . . . .	79	98	952	1,107	1,409
Belgium . . . . .	4,409	11,651	108,047	99,651	123,457	Belgium . . . . .	44	51	584	528	639
Bulgaria . . . . .	165	179	1,354	1,418	1,960	Denmark . . . . .	123	98	1,120	1,074	1,296
Denmark . . . . .	4,919	5,099	56,624	51,150	63,220	Spain . . . . .	31	24	276	236	282
Spain . . . . .	5,324	5,071	47,309	59,798	68,795	Estonia . . . . .	35	9	157	121	146
Estonia . . . . .	46	22	251	254	309	Irish Free State . .	...	...	(x) 10,579	(x) 18,748	24,340
Irish Free State . .	...	...	(x) 368	(x) 346	525	Finland . . . . .	15	33	223	227	260
Finland . . . . .	2,216	2,284	26,698	34,194	40,442	France . . . . .	323	357	2,381	2,004	3,536
France . . . . .	43,522	38,394	358,969	396,023	406,168	Gr. Britain and N.					
Gr. Britain and N.						Ireland . . . . .	26,325	26,422	485,096	485,508	541,616
Ireland . . . . .	3,460	3,726	31,789	31,536	37,858	Greece . . . . .	52	33	584	580	644
Greece . . . . .	847	1,204	11,144	10,765	12,650	Hungary . . . . .	23	33	516	580	650
Hungary . . . . .	527	573	5,110	5,770	7,563	Italy . . . . .	28	29	273	269	323
Italy . . . . .	7,597	8,408	77,332	81,915	98,480	Latvia . . . . .	0	9	108	143	168
Latvia . . . . .	4	33	326	315	351	Lithuania . . . . .	15	9	104	152	179
Lithuania . . . . .	4	40	414	419	473	Norway . . . . .	33	37	335	322	368
Norway . . . . .	5,269	3,840	32,677	31,180	37,990	Netherlands . . . .	2,540	2,564	25,300	25,794	31,024
Netherlands . . . .	7,796	8,248	88,314	85,092	100,483	Poland . . . . .	357	381	3,812	3,951	4,614
Poland . . . . .	820	1,630	14,974	14,674	17,539	Portugal . . . . .	73	57	580	514	597
Portugal . . . . .	701	1,069	9,337	9,555	11,413	Sweden . . . . .	57	86	750	785	928
Sweden . . . . .	6,012	8,554	93,558	82,206	100,823	Switzerland . . . .	165	168	1,499	1,429	1,781
Switzerland . . . . .	2,945	3,452	27,796	24,793	31,608	Czechoslovakia . .	108	86	1,576	1,321	1,473
Czechoslovakia . .	2,800	2,339	27,212	23,579	29,026	Yugoslavia . . . .	46	18	571	571	628
Yugoslavia . . . . .	1,870	996	15,031	17,484	20,362	Canada . . . . .	1,373	3,391	37,055	39,454	43,147
Canada . . . . .	1,475	2,282	25,272	26,542	33,689	United States . . .	5,774	6,184	78,617	76,062	87,151
United States . . . .	104,623	148,654	1,347,166	1,404,894	1,723,578	Chile . . . . .	425	635	4,689	4,480	5,362
Chile . . . . .	1,490	650	8,710	7,602	10,516	Syria and Lebanon .	11	18	470	385	351
Ceylon . . . . .	82	161	3,523	2,824	3,148	Turkey . . . . .	134	179	1,241	1,314	2,138
Japan . . . . .	417	375	4,497	3,616	4,478	Algeria . . . . .	...	...	(3) 1,702	(3) 2,083	3,150
Syria and Lebanon .	300	205	2,039	2,271	2,792	Egypt . . . . .	...	...	(3) 9,905	(3) 7,639	13,616
Turkey . . . . .	518	844	6,843	10,408	12,853	Tunis . . . . .	196	238	6,151	2,324	2,952
Algeria . . . . .	...	...	(3) 19,418	(3) 19,767	30,827	Union of S. Africa .	...	...	(x) 9,912	(x) 10,221	13,298
Egypt . . . . .	...	...	(3) 10,617	(3) 8,245	14,857	Australia . . . . .	3,336	2,452	37,298	40,193	46,441
Tunis . . . . .	337	157	2,895	2,436	3,036	New Zealand . . . .	...	...	(x) 8,347	(x) 8,091	14,405
Ua. of S. Africa . .	...	...	(x) 20,920	(x) 25,111	31,890						
Australia . . . . .	800	227	2,383	2,138	2,619						
New Zealand . . . .	...	...	(x) 300	(x) 302	430						
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India . . . . .	0	300	60	3,918	4,090	India . . . . .	318	454	5,858	5,368	6,282
						Java and Madura . .	...	...	(x) 8,342	(x) 9,681	11,830
<b>Totals . . . . .</b>	<b>241,776</b>	<b>300,382</b>	<b>2,768,765</b>	<b>2,840,465</b>	<b>3,469,093</b>	<b>Totals . . . . .</b>	<b>42,384</b>	<b>45,459</b>	<b>765,577</b>	<b>765,819</b>	<b>879,694</b>

(2) (3) See notes page 418.

COUNTRIES	APRIL		SEVEN MONTHS (Oct. 1-April 30)		TWELVE MONTHS (Oct. 1-Sept. 30)	COUNTRIES	APRIL		NINE MONTHS (Aug. 1-April 30)		TWELVE MONTHS August 1- (July 31)
	1932	1931	1931-32	1930-31	1930-31		1932	1931	1931-32	1930-31	1930-31
<b>Cacao (Thousand lbs.).</b>						<b>Total Wheat and Flour (*)</b> (Thousand centals).					
<b>EXPORTS.</b>						<b>a) NET EXPORTS</b>					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada . . . . .	...	...	(1) 4,041	(1) 5,053	9,905	Bulgaria . . . . .	586	476	5,915	1,724	3,527
Dominican Republ. . . . .	3,900	2,321	15,492	14,603	61,328	Spain . . . . .	0	9	(4)	73	104
Brazil . . . . .	...	...	(1) 112,410	(1) 87,511	146,409	Hungary . . . . .	388	320	9,354	9,125	10,591
Ecuador . . . . .	4,006	8,122	17,809	21,158	33,076	Lithuania . . . . .	4	08	40	560	567
Trinidad . . . . .	...	...	(1) 21,352	(1) 29,765	61,569	Poland . . . . .	379	223	1,314	2,161	2,580
Venezuela . . . . .	...	...	(1) 9,819	(1) 19,828	45,076	Rumania . . . . .	...	...	(1) 20,093	(1) 7,216	9,908
Ceylon . . . . .	717	683	7,747	6,169	8,360	U. S. S. R. . . . .	...	...	2(6) 37,426	2(6) 50,067	(6) 67,735
Java and Madura . . . . .	...	...	(1) 1,178	(1) 1,102	3,073	Yugoslavia . . . . .	791	77	8,124	2,041	3,862
Cameroon . . . . .	...	...	(1) 21,603	(1) 21,096	30,126	Canada . . . . .	5,174	3,653	89,173	113,386	154,489
Ivory Coast . . . . .	6,393	7,121	43,806	40,759	43,363	United States . . . . .	6,546	3,047	53,663	44,750	65,519
Gold Coast . . . . .	25,395	73,414	380,349	407,766	486,374	Argentina . . . . .	11,640	10,558	66,886	47,250	74,466
Nigeria . . . . .	10,490	2,438	98,443	99,270	116,385	Chile . . . . .	4	2	26	556	567
St. Thomas and Prince Is. . . . .	1,523	2,209	16,048	18,345	26,764	British India . . . . .	24	(4)	904	(4)	(4)
Togoland . . . . .	937	2,098	12,566	14,522	16,400	Syria and Lebanon . . . . .	(4)	(4)	110	(4)	(4)
<i>Importing Countries:</i>						Turkey . . . . .	116	18	758	223	282
Germany . . . . .	0	0	450	432	454	Algeria . . . . .	...	...	(3) 1,321	(3) 6,030	5,719
Belgium . . . . .	115	31	644	410	800	Tunis . . . . .	282	(4)	1,825	1,195	3,481
France . . . . .	0	0	2	223	223	Australia . . . . .	0,337	12,106	70,039	63,883	90,379
Netherlands . . . . .	379	753	4,383	7,377	10,079	<b>Totals . . . . .</b>	<b>35,220</b>	<b>30,557</b>	<b>367,880</b>	<b>350,640</b>	<b>492,962</b>
Czechoslovakia . . . . .	0	0	0	13	18	<b>b) NET IMPORTS.</b>					
United States . . . . .	855	597	5,038	4,890	8,521	<i>Importing Countries:</i>					
Australia . . . . .	0	0	119	37	86	Germany . . . . .	805	1,016	5,084	12,132	18,689
<b>Totals . . . . .</b>	<b>54,710</b>	<b>99,792</b>	<b>782,503</b>	<b>806,329</b>	<b>1,109,058</b>	Austria . . . . .	538	802	6,184	5,800	9,345
<b>IMPORTS.</b>						Belgium . . . . .	2,269	2,806	19,870	21,213	29,125
<i>Importing Countries:</i>						Denmark . . . . .	483	527	8,453	4,625	6,894
Germany . . . . .	16,947	19,332	124,138	118,031	180,001	Spain . . . . .	(5)	(5)	15	(5)	(5)
Austria . . . . .	1,230	1,082	8,151	7,218	10,662	Estonia . . . . .	33	13	228	386	485
Belgium . . . . .	3,836	3,766	15,867	16,887	25,532	Irish Free State . . . . .	...	...	(1) 7,740	(1) 7,985	11,286
Bulgaria . . . . .	73	126	754	509	774	Finland . . . . .	130	146	1,944	2,269	2,950
Denmark . . . . .	677	562	4,597	4,969	7,685	France . . . . .	5,816	3,567	29,659	21,488	36,493
Spain . . . . .	3,053	2,928	15,377	15,832	22,472	Gr. Brit. and N. Ir. . . . .	10,421	10,108	111,100	101,060	134,811
Estonia . . . . .	7	33	381	265	478	Greece . . . . .	1,208	1,329	10,767	10,166	14,454
Irish Free State . . . . .	...	...	(1) 805	(1) 873	1,786	Italy . . . . .	3,488	4,583	10,254	35,517	48,811
Finland . . . . .	7	33	115	148	220	Latvia . . . . .	20	49	366	791	924
France . . . . .	9,275	8,567	55,541	53,046	90,116	Norway . . . . .	461	337	4,297	3,708	4,985
Gr. Brit. and N. Ir. . . . .	15,130	14,090	92,323	93,333	141,747	Netherlands . . . . .	1,327	1,920	13,087	16,255	20,559
Greece . . . . .	168	196	2,152	1,517	2,480	Portugal . . . . .	24	64	664	408	1,607
Hungary . . . . .	392	807	3,532	3,318	5,432	Sweden . . . . .	406	192	3,009	2,460	2,939
Italy . . . . .	1,074	1,843	9,273	10,734	16,819	Switzerland . . . . .	(6) 911	(6) 688	(6) 8,855	(6) 8,642	(6) 11,094
Latvia . . . . .	106	31	1,038	979	1,724	Czechoslovakia . . . . .	1,116	309	11,263	8,157	10,302
Lithuania . . . . .	60	82	357	478	708	Ceylon . . . . .	35	44	445	456	597
Norway . . . . .	717	187	4,004	2,527	4,705	India . . . . .	(5)	631	(5)	2,161	3,062
Netherlands . . . . .	8,565	23,078	65,636	106,907	147,201	Indo-China . . . . .	42	42	406	461	571
Poland . . . . .	1,041	1,124	7,077	7,923	12,313	Japan . . . . .	1,239	1,283	9,255	6,942	10,964
Sweden . . . . .	1,885	1,241	8,148	6,679	9,092	Java and Madura . . . . .	...	...	(1) 1,043	(1) 871	1,367
Switzerland . . . . .	1,574	5,121	8,124	17,831	23,803	Syria and Lebanon . . . . .	106	4	(5)	64	101
Czechoslovakia . . . . .	2,760	2,332	11,674	10,803	18,237	Egypt . . . . .	...	...	(3) 2,685	(3) 3,382	5,763
Yugoslavia . . . . .	170	159	836	935	1,473	Tunis . . . . .	(5)	53	(5)	(5)	(5)
Canada . . . . .	582	840	9,059	9,738	15,371	Union of South Afr. . . . .	...	...	(1) 858	(1) 1,432	1,938
United States . . . . .	35,777	45,843	295,517	221,195	406,636	New Zealand . . . . .	...	...	(1) 258	(1) 276	487
Australia . . . . .	465	395	6,607	3,525	7,308						
New Zealand . . . . .	...	...	(1) 873	(1) 677	1,504						
<b>Totals . . . . .</b>	<b>103,571</b>	<b>133,298</b>	<b>752,361</b>	<b>716,527</b>	<b>1,156,129</b>	<b>Totals . . . . .</b>	<b>30,878</b>	<b>30,513</b>	<b>268,284</b>	<b>279,147</b>	<b>390,858</b>

(\*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,335.33 centals of grain.

a) Excess of exports over imports. — b) Excess of imports over exports.

(1) Data up to 31st March. — (2) Data up to 31st December. — (3) Data up to the end of February. — (4) See Net Imports. —

(5) See Net Exports. — (6) Wheat only.

## STOCKS

STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS  
IN GERMANY.

PRODUCTS	% Stocks : total production				% Available saleable quantities : total production			
	May 15, 1932	April 15, 1932	May 15, 1931	May 15, 1930	May 15 1932	April 15, 1932	May 15, 1931	May 15, 1930
Winter wheat . . . . .	5.9	10.4	4.7	7.3	3.9	7.1	2.4	4.1
Spring wheat . . . . .	9.4	19.8	6.9	7.2	7.4	14.7	5.0	4.4
Winter rye . . . . .	8.4	12.2	11.7	18.2	2.0	8.4	4.0	9.4
Winter barley . . . . .	4.5	6.0	4.9	9.4	0.4	0.8	0.5	1.4
Spring barley . . . . .	7.6	12.8	4.2	7.4	2.5	4.0	0.3	2.2
Oats . . . . .	19.1	28.8	21.3	25.7	2.6	3.9	3.0	6.7
Potatoes . . . . .	8.4	21.9	8.6	11.3	1.2	3.9	0.5	1.6

Authority: Preisberichtsstelle beim Deutschen Landwirtschaftsrat.

STOCKS OF CEREALS IN COMMERCIAL ELEVATORS AND MILLS IN GERMANY (1).

PRODUCTS	Last day of month			Last day of month		
	May 1932	April 1932	March 1932	May 1932	April 1932	March 1932
	1,000 centals			1,000 bushels or barrels		
WHEAT:						
Grain . . . . .	8,905	9,583	11,208	14,841	15,980	18,680
Flour for bread . . . . .	2,608	2,770	2,870	1,330	1,416	1,465
TOTAL (2) . . . . .	12,380	13,289	15,035	20,624	22,147	25,061
RYE:						
Grain . . . . .	7,608	8,201	8,236	13,586	14,045	14,708
Flour for bread . . . . .	1,235	1,316	1,228	630	672	627
TOTAL (2) . . . . .	9,255	9,956	9,373	16,526	17,781	17,634
BARLEY . . . . .	1,561	2,046	2,837	3,252	4,292	5,011
OATS . . . . .	1,442	1,720	2,218	4,506	5,374	6,931

(1) See note under the corresponding table in the Crop Report for March, at page 218. — (2) Including flour in terms of grain, on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain (1,000 barrels of flour = 4,355.55 bushels of wheat or 4,584.80 bushels of rye).

QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

PRODUCTS	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	June 1932	May 1932	April 1932	June 1931	June 1930	June 1932	May 1932	April 1932	June 1931	June 1930
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat) . . . . .	37,386	32,909	35,203	36,216	21,389	63,144	54,348	58,672	60,360	35,648
Rye . . . . .	1,603	2,208	3,571	979	874	2,863	3,948	6,877	1,749	1,560
Barley . . . . .	2,348	1,816	3,200	4,424	2,520	4,892	3,788	6,677	9,217	5,250
Oats . . . . .	2,906	3,069	2,336	1,981	1,069	9,080	9,590	7,800	6,190	3,340
Maize . . . . .	18,547	19,435	12,062	16,008	8,414	88,120	34,706	21,540	28,577	15,026

Authority: Broomhall's Corn Trade News

## COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	June 1932	May 1932	April 1932	June 1931	June 1930	June 1932	May 1932	April 1932	June 1931	June 1930
	1,000 cents					1,000 bushels				
WHEAT :										
Canadian in Canada. . . . .	85,229	95,989	103,734	75,900	70,812	142,040	159,982	172,890	126,601	128,019
U. S. in Canada . . . . .	10,932	16,123	15,347	4,711	2,015	18,254	26,872	25,578	7,851	4,359
U. S. in the United States .	104,465	111,943	124,828	125,406	72,182	174,109	186,572	207,213	209,110	120,303
Canad. in the United States .	4,322	2,780	0,855	3,586	8,623	7,203	4,634	11,425	5,026	14,372
Total . . . . .	204,968	226,835	250,264	209,693	160,232	341,616	378,060	417,100	349,488	267,053
RYE :										
Canadian in Canada. . . . .	5,400	5,793	6,103	7,032	4,476	9,642	10,345	10,899	12,557	7,002
U. S. in Canada . . . . .	127	119	140	1,070	2,140	226	213	250	1,911	3,821
U. S. in the United States .	5,272	5,316	5,641	5,936	7,040	9,415	9,403	10,073	10,599	12,572
Canad. in the United States .	396	445	913	1	151	600	705	1,831	2	270
Total . . . . .	11,135	11,673	12,797	14,039	13,807	19,883	20,846	22,853	25,069	24,655
BARLEY :										
Canadian in Canada. . . . .	3,083	3,816	4,628	7,145	9,997	6,423	7,949	9,642	14,886	20,827
U. S. in Canada . . . . .	43	12	12	83	402	89	25	25	68	963
U. S. in the United States .	1,442	2,271	2,006	2,991	3,285	3,004	4,731	4,179	6,232	6,843
Canad. in the United States .	136	610	710	301	1,141	283	1,271	1,479	627	2,376
Total . . . . .	4,704	6,709	7,356	10,470	14,885	9,799	13,976	15,325	21,813	31,009
OATS : (1)										
Canadian in Canada. . . . .	2,191	3,758	5,093	3,005	3,516	6,846	11,745	15,017	11,264	15,986
U. S. in Canada . . . . .	54	25	0	318	537	160	78	0	995	1,678
U. S. in the United States .	3,604	4,398	5,055	3,098	4,280	11,262	13,745	15,796	9,081	13,247
Canad. in the United States .	0	0	0	76	84	0	1	1	238	264
Total . . . . .	5,849	8,181	10,148	7,097	8,376	18,277	25,569	31,714	22,178	30,175
MAIZE :										
U. S. in Canada . . . . .	621	589	0	557	417	1,109	1,051	0	905	745
of other origin in Canada . .	660	670	808	209	462	1,178	1,207	1,443	535	824
U. S. in the United States .	11,596	12,328	12,652	6,909	6,419	20,708	22,015	22,593	12,337	11,463
Total . . . . .	12,877	13,588	13,460	7,765	7,298	22,995	24,273	24,036	13,807	13,032

(1) All oats expressed in bushels of 32 lbs.

## GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	June 1932	May 1932	April 1932	June 1931	June 1930	June 1932	May 1932	April 1932	June 1931	June 1930
	1,000 cents					1,000 bushels				
WHEAT :										
Grain . . . . .	6,048	7,396	8,376	3,624	3,744	10,080	13,180	13,960	6,040	6,240
Flour as grain . .	720	768	840	720	1,008	1,200	1,280	1,400	1,200	1,680
TOTAL . . .	6,768	8,164	9,216	4,344	4,752	11,280	14,460	15,360	7,240	7,920
Barley . . . . .	680	800	900	480	880	1,417	1,667	1,875	958	1,792
Oats . . . . .	492	464	448	512	768	1,360	1,450	1,400	1,800	2,400
Maize . . . . .	2,256	2,640	4,560	1,968	1,056	4,029	4,714	8,143	3,514	1,886

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.



## STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	May 1932	April 1932	March 1932	May 1931	May 1930	May 1932	April 1932	March 1932	May 1931	May 1930
	1,000 centals					1,000 bales (counting round as half bales)				
In consuming establishments . . . .	7,191	7,535	7,698	6,087	7,436	1,468	1,533	1,566	1,258	1,528
In public storage and at compresses . .	37,432	40,164	43,131	26,591	18,467	7,609	8,164	8,767	5,460	3,379
TOTAL . . .	44,623	47,699	50,829	32,678	23,903	9,077	9,697	10,333	6,718	4,907

## STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	June 1932	May 1932	April 1932	June 1931	June 1930	June 1932	May 1932	April 1932	June 1931	June 1930
	1,000 centals					1,000 bales (1 bale = 478 lbs.)				
Bombay (1) . . . .	3,396	3,024	2,524	3,780	5,023	710	633	528	703	1,051
Alexandria . . . .	4,378	4,676	4,842	4,470	3,894	916	978	1,013	998	815

Authorities: *East Indian Cotton Ass.* and *Commission de la Bourse de Minet-el-Bassal*.  
(1) Stocks held by exporters, dealers and mills.

## STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	June 1932	May 1932	April 1932	June 1931	June 1930	June 1932	May 1932	April 1932	June 1931	June 1930
	1,000 centals					1,000 bales (1 bale = 478 lbs.)				
<i>Great Britain:</i>										
American . . . .	2,008	2,022	2,129	2,455	1,782	420	423	445	514	373
Argentine, Brazilian, etc. . . . .	28	40	68	189	551	6	8	13	30	115
Peruvian, etc. . .	137	142	173	225	227	29	30	36	47	47
East Indian, etc.	411	431	505	814	315	86	101	105	170	66
Egyptian, Sudanese . . . . .	1,323	1,714	1,625	1,343	1,205	331	353	340	282	252
Other (1) . . . .	113	104	120	233	304	24	22	25	49	64
TOTAL . . . .	4,520	4,503	4,615	5,264	4,385	946	942	965	1,101	917
<i>Bremen:</i>										
American . . . .	1,579	1,460	1,527	2,176	1,918	330	305	319	455	401
Other . . . . .	27	23	33	53	44	6	5	7	11	9
TOTAL . . . .	1,606	1,483	1,560	2,229	1,962	336	310	326	466	410
<i>Le Havre:</i>										
American . . . .	801	857	812	1,557	906	163	179	170	326	208
Other . . . . .	61	57	55	156	162	13	12	11	33	34
TOTAL . . . .	862	914	867	1,713	1,068	181	191	181	359	242
<i>Total Continent (2):</i>										
American . . . .	3,217	3,173	3,238	4,354	3,455	673	664	677	911	723
Argentine, Brazilian, etc. . . . .	30	27	26	107	66	6	5	5	23	14
E. Indian, Australian, etc. . . . .	66	85	91	231	143	14	13	19	48	31
Egyptian . . . .	123	133	154	101	118	26	29	32	21	24
W. Indian, W. African, E. African, etc. . . . .	32	19	21	49	95	7	4	5	10	20
TOTAL . . . .	3,468	3,442	3,530	4,842	3,882	726	720	733	1,013	812

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. (2) Includes Bremen, Havre, and other Continental ports.

## MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTION	June 17, 1932	June 10, 1932	June 3, 1932	May 27, 1932	Average (2)					
					May	June	June	Commercial Season		
					1932	1932	1932	Season		
								1930-31	1929-30	
WHEAT.										
Budapest (b): Tisza region (78-80 kg. p. hl.; pengő p. quintal) . . . . .	12.45	12.55	12.65	12.02	12.76	15.04	n. 23.32	15.34	22.94	
Braila: Good quality (lei p. quintal) . . . . .	320	340	345	350	346	310	541	351	612	
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.) . . . . .	54	55 ½	60 ⅞	63 ⅞	63 ¼	61	103 ⅞	64 ¼	124 ⅞	
Chicago: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	51 ½	n. 51 ⅞	n. 55 ¼	n. 59 ½	n. 56	n. 75	98 ⅞	78	114 ⅞	
Minneapolis: No. 1 Northern (cents p. 60 lbs.) . . . . .	56	58 ½	62 ¼	66 ½	65 ½	74 ⅞	98 ½	77 ⅞	117 ½	
New York: No. 2 Hard Winter (cents p. 60 lbs.) . . . . .	61 ⅞	64 ¼	68 ½	72 ⅞	70 ⅞	n. q.	104 ½	n. 91 ⅞	121 ⅞	
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper p. quintal) . . . . .	6.55	6.85	7.30	7.25	7.16	5.96	10.35	6.88	10.65	
Karachi: Karachi white, 2 % barley, 1 ½ % dirt (rupees p. 556 lbs.) . . . . .	23-0-0	22-10-0	22-10-0	22-10-0	21-7-6	16-14-0	29-13-3	19-15-2	36-6-9	
Berlin: Home grown (Reichsmarks p. quintal) . . . . .	(3) 25.30	(3) 26.10	26.50	27.00	27.35	27.20	28.75	26.00	25.33	
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No. 3 Manitoba . . . . .	(4) 9.08	(4) 9.23	(4) 9.92	(4) 10.41	(4) 10.37	(4) 11.09	18.10	(4) 12.65	21.30	
No. 2 Hard Winter . . . . .	n. q.	n. q.	n. 10	n. q.	n. q.	—	17.18	n. 13.00	19.49	
Barusso (79 kg. p. hectol.) . . . . .	(5) 8.39	(5) 8.80	(5) 9.23	(5) 9.56	(5) 9.48	(6) 9.29	(6) 16.89	11.10	13.72	
Antwerp (Belgian francs p. quintal):										
Home grown . . . . .	85.00	85.00	86.00	86.00	85.50	95.00	158.50	95.50	154.75	
No. 2 Hard Winter, Gulf . . . . .	(7) 79.00	(7) 85.00	(7) 88.00	(7) 86.00	(7) 84.75	92.00	157.50	112.50	171.00	
Paris: Home grown, 75-77 kg. (francs p. quintal) . . . . .	168.00	171.25	170.50	181.25	175.25	188.10	133.50	175.00	139.40	
London: Home grown (shillings p. 504 lbs.) . . . . .	28/6	28/3	27/-	27/-	26/6	26/4	37/4	27/1	40/10	
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):										
South Russian (on sample) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	22/1	n. q.	23/7	n. q.	
No. 3 Manitoba . . . . .	23/7 ½	23/3	25/9	27/1 ½	26/10 ½	22/-	38/7	26/4	45/2	
No. 2 Hard Winter . . . . .	24/6	24/-	26/6	28/-	26/11	21/11	30/2	26/4	41/5	
White Pacific . . . . .	(8) 25/9	(8) 26/-	(9) 27/3	(9) 29/3	(9) 29/7	22/9	37/8	26/7	42/3	
Rosafe (63 ½ lbs.), afloat . . . . .	(10) 23/6	(10) 23/6	(10) 26/-	(10) 26/3	(10) 25/9	(11) 20/1	(12) 37/7	23/5	40/3	
Choice White Karachi . . . . .	n. q.	n. q.	n. q.	28/6	28/2	22/7	38/-	27/-	42/2	
Australian . . . . .	24/6	25/6	27/4 ½	27/0	27/1	22/7	30/5	26/7	43/6	
Milan (b): Home grown, soft (lire p. quintal) . . . . .	113.50	110.50	112.50	117.50	120.75	100.50	142.00	109.10	131.80	
Genoa c. i. f. (shillings p. metric ton): La Plata . . . . .	13)n.2.03	13)n.2.13	13)n.2.13	13)n.2.32	13)n.2.30	95/4	174/6	110/-	184/6	
RYE.										
Budapest (b): Home grown (pengő p. quintal) . . . . .	12.50	12.45	13.30	13.87	14.03	13.75	11.27	10.70	13.44	
Berlin: Home grown (Reichsmarks per quintal) . . . . .	18.70	19.10	19.60	19.70	20.17	20.42	17.45	17.18	17.04	
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. quintal) . . . . .	7.07	7.18	8.21	8.92	8.99	(14) 7.91	n. 8.40	n. 7.65	14.57	
Minneapolis: No. 2 (cents p. 56 lbs.) . . . . .	32	33	33 ½	38	39 ⅞	36 ⅞	56 ⅞	42 ⅞	80 ⅞	
Groningen (c): Home grown (florins p. quintal) . . . . .	5.90	5.95	5.95	6.00	6.00	4.30	4.34	4.45	6.88	
BARLEY.										
Braila: Average quality (lei p. quintal) (3) . . . . .	270	260	270	265	290	233	196	232	304	
Winnipeg: No. 4 Western (cents p. 48 lbs.) . . . . .	34 ⅞	35 ½	34 ½	38 ¼	37 ⅞	31 ⅞	35 ⅞	28 ⅞	51 ⅞	
Chicago: Feeding (cents p. 48 lbs.) . . . . .	34	36	38	43	43	36 ¼	49 ½	43 ⅞	57 ⅞	
Berlin: Home grown fodder (Reichsmarks per quintal) . . . . .	16.80	17	17.85	18.15	18.17	20.36	17.52	19.52	17.40	
Antwerp: Danube (francs p. quintal) . . . . .	77.00	78.50	81.50	83.00	85.00	79.00	75.50	78.25	107.50	
London: English malting (shillings p. 448 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	32/6	31/-	35/8	39/-	
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):										
Danubian 3 % . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	(9) 15/1	15/1	15/2	22/8	
Russian (Azoff-Black sea) . . . . .	(9) 18/9	n. q.	n. q.	n. q.	n. q.	(9) 15/1	14/10	14/8	18/11	
Canadian Western, No. 3 . . . . .	19/10 ½	19/6	20/-	21/3	21/5	16/5	n. q.	15/11	27/-	
Californian malting (shillings p. 448 lbs.) . . . . .	23/-	24/-	n. 26/-	n. 26/-	n. 28/1	32/6	29/3	27/8	32/6	
Groningen (c): Home grown winter (fl. p. quintal) . . . . .	6.50	6.30	6.30	6.30	6.42	5.37	6.55	4.97	7.55	

(2) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) July delivery. — (4) No. 2 Manitoba. — (5) 80-81 kg. p. hl. — (6) 78 kg. p. hl. — (7) No. 1 Hard Winter. — (8) Shipping July-August. — (9) Shipping August-September. — (10) 64 lbs. p. bushel. — (11) 63 lbs. p. bushel. — (12) 62 ½ lbs. p. bushel. — (13) Price in \$ per quintal. — (14) 72-73 Kg. p. hl.

PRODUCTS, MARKETS AND DESCRIPTION	June 17, 1932	June 10, 1932	June 3, 1932	May 27, 1932	Average (1)					
					May 1932	June 1932	June 1930		Commercial Season	
									1930-31	1929-30
<b>OATS.</b>										
Braila: Good quality (1c p. quintal) . . . . .	305	265	280	300	316	350	197		247	256
Winnipeg: No. 2 White (cents per 34 lbs.) . . .	32 1/4	35 1/4	34 1/4	36 1/4	36	30	47 3/4		30	53 1/4
Chicago: No. 2 White (cents per 32 lbs.) . . . .	22 1/4	21 1/2	23 1/2	23 1/2	24 1/8	27 1/8	39 1/4		32 1/4	44 1/4
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	5.85	5.50	5.80	5.80	5.80	3.88	3.97		3.58	5.30
Berlin: Home grown (Reichsmarks p. quintal) . .	15.80	15.90	16.35	16.15	16.52	17.64	15.09		16.17	15.62
Paris: Home grown, black and other (francs p. quintal) . . . . .	111.75	112.00	110.25	115.50	114.35	88.80	67.50		81.00	81.15
London: Home grown white (shillings p. 336 lbs.)	24/6	24/6	24/6	24/3	23/8	20/6	19/3		18/4	21/-
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.):										
Danubian (39-40 lbs.) . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	2) 13/-	n. 12/1	2) n. 16/4	
Plate (f. a. q.) . . . . .	14/1 1/2	14/-	14/3	14/6	15/1	10/7	11/10		10/9	16/1
Chilian Tawny . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	11/11	13/4		12/-	17/8
Milan (b): spot (lire p. quintal):										
Home grown . . . . .	n. 72.50	n. 72.50	n. 76.50	n. 76.50	n. 77.00	70.00	72.50		78.95	80.75
Foreign imported . . . . .	64.00	64.00	64.00	64.00	66.00	61.00	64.00		60.40	74.80
<b>MAIZE.</b>										
Braila: Danube (1c p. quintal) . . . . .	198	198	190	196	200	248	282		210	309
Chicago: No. 2 Mixed American (cents p. 56 lbs.) .	32 1/4	30 1/2	30 1/4	32 1/2	32 1/4	57	79 1/4		58 1/4	85 1/4
Buenos Aires (a): Yellow Plate (pesos paper p. quintal) . . . . .	4.55	4.62	4.65	4.60	4.55	3.82	5.96		3.82	6.17
Antwerp, spot (Belgian francs p. quintal):										
Bessarabian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	73.50	92.00		71.25	n. 97.25
Cinquantino . . . . .	67.50	64.00	63.50	63.50	63.10	70.50	129.50		81.00	131.25
Yellow Plate . . . . .	59.00	56.00	57.00	56.00	57.75	63.50	102.50		66.00	109.25
London and Liverpool, parcels, c. i. f. (shillings p. 480 lbs.):										
Danube . . . . .	18/6	18/9	n. q.	n. q.	n. q.	n. q.	22/7	n. 17/4		24/11
Yellow Plate . . . . .	17/3	17/4 1/2	17/4 1/2	17.9	18/1	14/7	24/3		15/6	25/3
No. 2 White African . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	23/4	n. 18/11		26/-
Milan (b): Home grown (lire p. quintal) . . . .	72.50	73.50	73.50	75.50	77.50	52.50	67.50		51.90	71.35
<b>RICE (CLEANED).</b>										
									1931	1930
Milan (b): Maratelli (lire p. quintal) . . . . .	156.00	155.50	155.50	155.00	158.50	115.60	164.75		117.35	152.15
Rangoon: No. 2 Burma (rupees p. 750c lbs.) . .	280	275	282 1/2	282 1/2	3) 290 1/8	207	437 1/2		249 1/4	393 1/4
Saigon (Indochinese piastres p. quintal):										
No. 1 Round white (25 % broken) . . . . .	5.80	5.83	6.13	5.96	4) 6.07	5.52	12.40		6.73	11.36
No. 2 Japan (40 % broken) . . . . .	5.39	5.47	5.63	5.47	5) 5.53	5.03	11.90		6.20	10.89
London (a): c. i. f. (shillings p. 112 lbs.):										
Spanish Beloch, No. 3 oiled . . . . .	18/6	18/7 1/2	13/9	13/7 1/4	13/6	12/5	14/7		11/11	14/1
Italian good, No. 6 oiled . . . . .	14/-	15/-	15/-	15/-	14/6	15/3	15/1		13/7	14/11
American Blue Rose . . . . .	15/9	15/9	15/9	16/-	16/1	18/1	24/-		18/7	21/9
Burma, No. 2 . . . . .	8/-	8/3	8/4 1/2	8/7 1/2	8/11	6/9	11/10		7/11	10/11
Saigon, No. 1 . . . . .	8 1/4 1/2	8/6	8/7 1/2	8/9	8/9	6/9	12/2		8/1	11/6
Siam, Garden, No. 1 . . . . .	6/8 10/1 1/2	6/9 3	6/9 1 1/2	6/9 1 1/4	6) 9/5	7/11	15/7 1/4		9/5	14/-
Tokio: Various qualities (yens p. koku) . . . .	21.80	21.80	21.80	21.40	n. 21.80	13.32	27.45		13.46	25.57
<b>LINSEED.</b>										
Buenos Aires (a): Current quality (pesos paper p. quintal) . . . . .	8.70	8.75	8.70	8.75	8.75	10.62	18.97		10.82	17.19
Antwerp: Plate (Belgian francs p. quintal) . . .	98.00	99.00	97.00	97.00	97.35	144.50	299.00		146.00	284.25
Hull, c. i. f.: Plate (p. sterling p. 1. ton) . . .	7-11-3	7-11-3	7-10-0	7-12-6	7-14-1	8-7-6	16-16-7		8-14-1	15-0-5
London, c. i. f.: Bombay bold (p. st. p. long ton).	10-5-0	10-0-0	10-15-0	10-18-9	10-17-10	11-6-10	13-11-8		11-9-6	17-14-4
Duluth: No. 1, Northern (cents p. 56 lbs.) . . .	105 1/4	105	113	116 1/4	122 1/2	149 1/4	269		148	236

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) Weight not indicated. — (3) Rectified prices: 30 May: 290; 31 May: 296; 3 May: 290; 6 May: 286; 29 April: 6.29; 22 April: 6.29; April average: 6.12. — (4) 30 May: 5.47; 31 May: 5.55; 3 May: 5.43; 6 May: 5.43; 29 April: 5.73; 22 April: 5.73; April average: 5.60. — (5) Siam special.

PRODUCTS, MARKETS AND DESCRIPTION	June 17, 1932	June 20, 1932	June 3, 1932	May 27, 1932	Average (x)				Commercial Season	
					May 1932	June 1932	June 1930		1930-31	1929-30
<b>COTTONSEED.</b>										
Alexandria : Sakellaridis (piastres per ardeb) . . .	51.5	50.3	52.2	52.2	52.4	46.7	58.7		52.2	67.9
Hull : Sakellaridis (p. sterl. per long ton) . . . .	5-5-0	5-3-9	5-6-3	5-7-6	5-7-10	5-0-0	6-2-10		5-12-6	6-18-2
<b>COTTON.</b>										
New Orleans : Middling (cents per lb.) . . . . .	5.15	5.06	5.23	5.59	5.74	8.91	13.67		10.07	16.17
New York : Middling (cents per lb.) . . . . .	5.25	5.10	5.15	5.60	5.76	9.12	14.50		10.38	16.60
Bombay : M. g. Broach f. g. (rupees per 784 lbs.) .	159	151	n. 157	167	168 1/4	175	228 3/4		191 1/4	238 1/2
Alexandria (a) (talaris per kantar) :										
Sakellaridis f. g. f. . . . .	11.02	9.87	9.72	10.57	10.66	13.47	27 1/2		17.12	28 1/4
Ashmouni (Upper Egypt) f. g. f. . . . .	9.35	8.45	8.30	8.90	9.15	10.07	19 3/4		12.00	19 1/2
Biemen : Middling (U. S. cents per lb.) . . . . .	6.37	6.07	6.35	6.73	6.70	10.18	15.95		11.59	18.27
M. g. Broach fully good (pence per lb.) . . . .	n. 3.90	n. 3.80	n. 3.90	n. 4.10	n. 4.17	n. 4.20	n. 5.61	n. 4.63	n. 4.63	n. 6.83
Le Havre : Middling, Gulf (francs per 50 kg.) . . .	187	181	186	198	202	307	467		349	545
Liverpool (pence per lb.) :										
Middling fair . . . . .	n. 5.26	n. 5.04	n. 5.10	n. 5.45	n. 5.52	n. 6.13	n. 9.32	n. 6.98	n. 6.98	n. 10.39
Middling . . . . .	4.31	4.09	4.10	4.45	4.52	4.93	7.97		5.72	9.08
São Paulo, good fair . . . . .	n. 4.51	n. 4.29	n. 4.35	n. 4.70	n. 4.77	5.13	7.77		5.81	9.02
M. g. Broach, fully good . . . . .	n. 3.82	n. 3.62	n. 3.69	n. 3.98	n. 4.06	n. 4.00	5.42		4.25	n. 6.80
Sakellaridis, fully good fair . . . . .	6.05	5.55	5.60	5.95	6.09	7.71	12.72		9.08	14.52
<b>BUTTER.</b>										
Copenhagen (a) (Kr. p. quintal) . . . . .	142	142	152	146	148 1/4	192	227		209	245
Maastricht, auction (b) : Dutch (florins p. kg.) .	1.15	1.14	0.84	0.81	0.93	1.35	1.57		1.38	1.70
Hamburg, auction (b) : Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . . . .	108.95	109.09	109.44	110.71	116.81	123.28	133.10		131.22	146.67
Kempten (b) : Allgäu butter (Pfennige p. half kg.)	6) 102	6) 106	6) 106	6) 110	6) 114	105	118		110	128
London (c) (shillings p. cwt.) :										
British blended . . . . .	130/8	130/8	130/8	130/8	130/8	140/-	154/-		140/4	158/8
Danish . . . . .	107/-	109/-	108/-	108/-	113/3	122/-	134/3		133/4	153/8
Irish creamery, salted . . . . .	104/-	n. q.	n. q.	n. q.	n. q.	118/6	130/-		119/8	134/10
Dutch . . . . .	112/-	113/-	112/-	n. q.	n. q.	117/6	134/6		132/1	151/11
Argentine . . . . .	98/-	102/-	102/-	104/-	106/6	117/-	133/-		117/7	139/10
Siberian . . . . .	n. q.	n. q.	n. q.	n. q.	n. q.	107/6	126/6	(7)	97/4	131/6
Australian, salted . . . . .	102/-	104/-	103/-	101/-	103/6	115/6	135/6		116/8	136/9
New Zealand, salted . . . . .	103/-	105/-	106/-	102/-	104/6	117/6	136/3		119/11	137/8
<b>CHEESE.</b>										
Milan (lire per quintal) :										
Parmigiano-Reggiano, 1st quality of last year's production . . . . .	900	900	900	8) 900	8) 900	1,140	1,237		1,108	1,160
Green Gorgonzola, mature, choice . . . . .	430	425	425	440	450	610	625		616	671
Rome : Roman pecorino, choice (lire p. quintal) .	9) 1,225	9) 1,225	9) 1,225	1,347	1,321	1,189	1,215		1,121	1,207
Alkmaar : Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small ; florins, p. 50 kg.) . . . . .	25.25	24.00	21.00	20.00	20.25	34.50	39.62		32.68	40.83
Gouda : Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.) . . . . .	29.00	22.00	19.50	18.50	18.75	38.25	42.00		37.93	45.56
Kempten (b) : (Pfennige per half kg.) :										
Softcheese, green (20 % butterfat) . . . . .	21 1/2	20 1/2	20 1/2	20 1/2	20 1/2	21 1/2	26		24	27
Emmenthal from the Allgäu (whole milk cheese) 1st quality . . . . .	83	83	83	83	83	99 1/2	100.99		97 1/2	100.97
London (c) (shillings per cwt.) :										
English Cheddar . . . . .	124/-	124/-	124/-	122/-	120/6	104/-	90/-		99/10	108/4
Canadian . . . . .	80/8	81/-	79/-	78/9	79/10	109/-	75/9		75/9	98/11
New Zealand . . . . .	58/-	59/-	61/-	60/-	62/-	59/-	84/9		63/2	82/2
Liverpool (c) : Engl. Cheshire, ungraded (sh. p. cwt.)	70/-	70/-	74/8	79/4	9) 96/3	67/8	74/1		94/3	96/5

(2) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday. — (x) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) 20 June. — (3) 20 May: 5.85. — (4) 20 May: 5.90. — (5) 20 May: 205. — (6) Quotation system changed; actual prices are generally 3 Pt. higher than according to the former system, used in Kempten. — (7) Average calculated from the prices for the Fridays and the Thursdays preceding. — (8) Production of 1931. — (9) New. — (10) Average price of all qualities.

## THE PRICES OF AGRICULTURAL PRODUCTS IN MAY 1932

In the following pages the index-numbers of prices of agricultural products and other price-indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled "Index-numbers of prices of agricultural products and other price-indices of interest to the farmer". We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilisation from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting formally to unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary tables is given below.

COUNTRIES	Percentage variations in the index-numbers for May, 1932			
	compared with those for April, 1932		compared with those for May, 1931	
	Index-numbers of prices of agricultural products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany . . . . .	— 1.4	— 1.2	— 14.5	— 14.2
England and Wales . . . . .	— 1.7	— 3.1	— 5.7	— 2.9
Argentina . . . . .	— 3.3	—	— 6.4	—
Canada . . . . .	— 2.3	— 1.0	— 15.8	— 7.3
Estonia . . . . .	— 6.5	—	— 23.4	—
United States . . . . . a)	— 5.1	—	— 34.9	—
Finland . . . . . b)	— 5.3	— 1.7	— 30.6	— 9.7
Hungary . . . . .	— 1.4	— 1.1	+ 1.4	+ 4.8
Italy . . . . .	— 0	— 0	+ 5.9	+ 4.8
New Zealand . . . . .	— 0.4	— 2.0	+ 0.3	— 10.0
Netherlands . . . . .	+ 1.0	—	— 2.6	—
Poland . . . . .	— 3.9	— 1.1	— 33.8	— 22.5
Yugoslavia . . . . . c)	+ 4.1	+ 1.2	— 8.1	— 11.6
	d) — 1.1	+ 1.1	a) — 8.7	— 13.3
	d) — 0.2		d) — 26.9	

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

# **NUMBERS-INDEX OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER \***

COUNTRIES AND CLASSIFICATION	May	April	March	Feb.	Jan.	Dec.	May	May	Year	
	1932	1932	1932	1932	1932	1931	1931	1930	1931	1930
GERMANY (Statistisches Reichsamt) 1913 = 100.										
Foodstuffs of vegetable origin . . . . .	121.2	122.4	121.6	119.5	115.3	112.3	131.8	118.1	119.3	115.3
Livestock . . . . .	63.2	64.2	65.6	65.7	65.7	68.4	83.9	110.2	83.0	112.4
Livestock products . . . . .	90.0	90.3	97.6	95.5	92.1	101.1	102.5	103.7	103.4	121.7
Feeding stuffs . . . . .	96.1	99.7	99.0	93.5	92.0	93.6	120.0	95.6	101.9	93.2
Total agricultural products . . . . .	98.4	94.7	96.5	94.6	92.1	94.5	109.2	110.7	103.8	113.1
Fertilizers . . . . .	70.7	71.7	72.2	72.0	71.3	70.4	77.2	83.3	76.5	82.4
Agricultural dead stock . . . . .	116.4	117.0	117.2	118.9	122.6	123.3	130.6	140.1	130.7	139.4
Finished manufactures ("Gebrauchsgüter") . . . . .	118.8	119.9	121.5	123.6	126.9	132.4	141.7	161.3	140.1	159.3
General index-number . . . . .	97.2	98.4	99.3	99.3	100.0	103.7	113.3	125.7	110.9	124.6
ENGLAND AND WALES (Ministry of Agriculture) Average of corresponding months 1911-13 = 100.										
Agricultural products . . . . .	115	117	113	117	122	117	122	134	120	134
Feeding stuffs . . . . .	97	99	102	97	95	93	87	96	83	96
Fertilizers . . . . .	91	91	91	91	91	91	100	102	96	101
General index-number (1). . . . .	94.4	97.0	98.9	102.0	99.6	100.5	96.7	116.2	97.7	114.1
ARGENTINA (2) (Banco de la Nación Argentina) 1926 = 100.										
Cereals and linseed . . . . .	59.9	61.3	63.1	59.1	55.3	53.2	54.3	90.9	55.8	82.3
Meat . . . . .	69.5	70.4	70.5	72.3	72.2	77.1	89.0	115.6	91.6	110.9
Hides and skins . . . . .	40.6	47.3	61.6	61.3	62.7	59.1	63.1	69.5	64.5	71.6
Wool . . . . .	41.1	46.1	43.7	49.4	49.1	51.7	57.6	75.8	61.2	67.4
Dairy products . . . . .	53.4	53.7	53.8	53.9	53.3	60.6	73.4	80.3	74.5	82.4
Forest products . . . . .	66.3	66.3	73.3	73.3	79.3	80.5	103.7	107.8	99.3	107.9
Total agricultural products . . . . .	58.5	60.5	63.3	61.0	53.9	61.4	62.5	92.3	63.3	85.5
CANADA (2) (Internal Trade Branch of the Dominion Bureau of Statistics) 1926 = 100.										
Field products (grain, etc.) . . . . .	44.6	44.5	43.7	43.7	42.0	42.2	48.2	81.3	44.6	70.0
Animals and animal products . . . . .	53.7	62.1	65.2	66.2	63.3	71.1	76.9	109.6	77.6	102.9
Total Canadian farm products . . . . .	49.9	51.1	51.7	52.1	52.0	53.0	53.9	91.9	57.0	82.3
Fertilizers . . . . .	70.5	71.4	72.0	72.0	71.0	71.1	86.9	91.5	83.0	88.2
Consumer's goods (other than foodstuffs etc.) . . . . .	73.7	73.3	73.9	79.7	79.3	79.9	79.7	86.7	80.5	86.3
General index-number . . . . .	67.7	68.4	69.1	69.2	69.4	70.3	73.0	89.7	72.6	86.6
ESTONIA (Central Bureau of Statistics) 1913 = 100.										
Commodities imported (3). . . . .	114	114	113	112	117	125	135	113	129	113
Commodities exported . . . . .	56	62	68	64	60	64	77	103	76	103
Agricultural products imported and exported (3)	72	77	81	78	76	81	94	106	91	103

\* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930), as well as to pages 77 to 79 of the "Crop Report" of January 1932.

(1) Calculated by the "Statist", reduced to base-year 1913 = 100. — (2) Average data for the year 1931 are provisional. — (3) From January 1932 the price of rye is excluded from the calculations.

COUNTRIES AND CLASSIFICATION	May	April	March	Feb.	Jan.	Dec.	May	May	Year	
	1932	1932	1932	1932	1932	1931	1931	1930	1931	1930
<b>UNITED STATES</b> (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals . . . . .	49	50	51	51	52	52	74	105	68	100
Fruits and vegetables . . . . .	80	78	73	68	70	68	119	193	98	158
Meat animals . . . . .	59	66	69	65	68	68	99	142	93	134
Dairy products . . . . .	69	74	76	79	85	92	91	123	94	123
Poultry and poultry products . . . . .	60	60	61	70	87	120	77	110	98	126
Cotton and cottonseed . . . . .	42	46	50	47	45	45	74	119	68	102
Total agricultural products . . . . .	56	59	61	60	63	66	86	124	80	117
Commodities purchased by farmers (1) . . . . .	112	114	115	116	118	123	181	150	129	146
Agricultural wages (1) . . . . .	—	—	94	—	98	—	2) 127	2) 162	116	152
<b>UNITED STATES</b> (Bureau of Labor) 1926 = 100.										
Grains . . . . .	42.6	44.5	48.5	46.1	46.7	47.0	59.6	82.1	53.0	58.3
Livestock and poultry . . . . .	44.4	49.2	51.4	50.3	53.4	51.7	64.1	93.2	63.9	89.2
Other farm products . . . . .	49.6	51.2	52.1	52.7	54.8	61.2	71.5	96.5	69.2	91.1
Total farm products . . . . .	46.6	49.2	50.2	50.6	52.3	55.7	67.1	93.0	64.3	88.3
Agricultural implements . . . . .	84.9	85.0	85.0	85.1	85.5	92.1	94.7	95.0	94.0	95.1
Fertilizer materials . . . . .	69.4	70.1	68.6	69.8	69.9	70.1	80.5	86.5	76.8	85.6
Mixed fertilizers . . . . .	69.0	71.1	73.2	73.7	75.5	77.1	82.8	93.6	82.0	93.6
Cattle feed . . . . .	45.9	53.4	52.4	48.2	53.0	53.9	67.9	110.3	62.7	99.7
Non-agricultural commodities . . . . .	68.1	68.9	69.3	69.6	70.3	69.3	72.6	88.1	73.0	85.9
General index-number . . . . .	64.4	65.5	66.0	66.3	67.3	66.3	71.3	89.1	71.1	86.3
<b>FINLAND</b> (Central Bureau of Statistics) 1926 = 100.										
Cereals . . . . .	89	89	92	94	96	93	79	81	77	76
Potatoes . . . . .	69	69	69	68	68	54	68	76	68	76
Fodder . . . . .	72	70	70	71	73	71	67	68	63	62
Meat . . . . .	63	61	67	63	57	57	67	90	64	58
Dairy products . . . . .	72	74	73	84	90	92	71	76	76	84
Total agricultural products . . . . .	72	73	77	78	78	78	71	82	72	82
General index-number . . . . .	88	89	92	93	94	92	84	90	84	90
<b>HUNGARY</b> (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products . . . . .	90	90	92	90	89	89	85	84	—	—
General index-number . . . . .	97	97	99	99	98	99	98	96	—	—
<b>ITALY</b> (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products . . . . .	359.91	361.18	351.62	349.57	350.71	342.35	357.20	418.45	348.11	418.39
General index-number . . . . .	312.54	318.79	322.14	323.49	325.92	325.54	347.16	419.90	341.57	411.04
<b>NEW ZEALAND</b> (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce . . . . .	95.8	96.5	99.3	90.8	91.5	91.5	93.6	122.6	99.3	120.7
Meat . . . . .	113.0	116.9	109.8	118.5	122.8	137.8	116.5	164.9	129.2	164.7
Wool . . . . .	59.3	60.9	66.7	64.9	66.8	61.7	76.7	96.6	67.7	100.7
Hides, skins, and tallow . . . . .	71.9	74.5	77.6	75.1	72.1	67.0	95.1	165.5	82.7	145.4
Miscellaneous . . . . .	131.2	136.5	140.8	139.0	112.3	135.5	180.7	189.6	127.4	134.0
Total agricultural products . . . . .	99.7	99.5	87.8	86.4	85.0	94.8	96.2	131.8	96.3	126.7

(1) 1910-14 = 100.

(2) April.

COUNTRIES AND CLASSIFICATION	May 1931	April 1932	March 1932	Febr. 1932	Jan. 1932	Dec. 1931	May 1931	May 1930	Year	
									1931	1930
<b>NORWAY (1)</b> (Kgl. Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals . . . . .	125	123	123	122	123	108	107	120	112	114
Potatoes . . . . .	155	151	150	140	137	126	157	121	150	152
Pork . . . . .	86	85	83	93	95	90	73	114	86	98
Other meat . . . . .	116	113	119	120	113	126	166	206	133	198
Eggs . . . . .	69	70	81	87	90	114	83	97	96	121
Dairy products . . . . .	119	119	123	130	129	136	124	148	129	150
Concentrated feeding stuffs . . . . .	106	104	106	108	109	108	108	128	103	117
Maize . . . . .	89	87	87	83	86	85	85	115	82	103
Fertilizers . . . . .	88	89	89	91	91	86	96	105	90	101
<b>NETHERLANDS</b> (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil . . . . .	56	56	56	60	53	57	83	55	(2) 72	(2) 68
Animal products . . . . .	47	49	51	54	53	53	72	88	(2) 77	(2) 95
Total agricultural products . . . . .	49	51	52	55	54	54	74	80	(2) 76	(2) 88
Agricultural wages . . . . .	83	95	95	95	95	95	95	100	(2) 99	(2) 100
General index-number (3) . . . . .	53.5	54.1	55.5	56.2	56.8	57.4	63.0	79.8	65.7	79.2
<b>POLAND (4)</b> (Central Bureau of Statistics) 1927 = 100.										
Products of the soil . . . . .	62.3	61.7	57.1	53.8	52.7	58.0	68.3	50.8	53.9	52.1
Products of agricultural industry . . . . .	71.6	71.5	67.1	64.5	62.6	66.2	77.2	71.0	65.9	63.9
Total products of plant origin . . . . .	67.2	66.8	62.3	59.3	57.8	62.4	73.1	60.3	60.0	60.5
Animals . . . . .	52.5	49.7	39.6	37.8	37.5	41.3	56.2	37.7	55.8	52.4
Dairy products . . . . .	57.9	51.4	53.7	68.5	56.9	63.0	65.1	74.4	68.0	81.5
Total products of animal origin . . . . .	55.2	50.8	45.6	49.5	45.4	51.3	60.1	81.6	60.8	81.9
Total agricultural products . . . . .	61.4	59.0	54.1	54.5	51.8	57.2	66.8	68.3	59.7	68.5
Fertilizers . . . . .	95.1	94.1	94.1	94.1	108.4	108.4	124.7	130.6	120.2	127.3
Industrial products . . . . .	69.4	70.0	71.6	73.0	74.4	74.0	81.3	96.3	79.4	94.0
General index-number . . . . .	66.1	65.3	63.8	64.6	63.9	66.4	74.8	83.3	70.5	82.3
<b>YUGOSLAVIA</b> (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil . . . . .	73.5	74.3	76.0	70.3	69.0	70.6	80.5	94.0	74.3	89.3
Animal products . . . . .	53.5	53.6	55.0	57.6	60.5	58.6	73.2	99.9	72.2	96.3
Industrial products . . . . .	65.0	66.2	63.3	68.8	69.2	63.5	78.0	81.0	71.4	81.8
General index-number . . . . .	65.4	66.1	67.8	67.3	67.8	67.2	75.4	88.8	72.9	86.6

(1) The agricultural years refer to the period April 1-March 31. — (2) Agricultural year July 1-June 30. — (3) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100. — (4) Average data for the year 1931 are provisional.



# RATES OF FREIGHT

(Rates for full cargoes):

VOYAGES	June	June	June	May	Average					
	17,	10,	3,	27,	May	June	June	Commercial		
	1932	1932	1932	1932	1932	1931	1930	Season		
SHIPMENTS OF WHEAT AND MAIZE.										
Danube to Antwerp/Hamburg . . . . .	(shill. per	n. q.	n. q.	n. q.	n. 18/6	13/9	n. 13/6	18/5	13/11	15/8
Black Sea to Antwerp/Hamburg . . . . .	long ton)	n. q.	10/4½	10/3	10/8	n. 10/6	10/4	n. q.	10/10	n. q.
St. John to Liverpool (1) . . . . .	(shill. per	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1/6	1/5
Montreal to United Kingdom . . . . .	480 lbs.)	2) 0.07	2) 0.07	2) 0.07	2) 0.07½	(2) 0.08	1/8	1/9	1/10	1/10
Gulf to United Kingdom . . . . .	(shill. per	1) 2/3	1) 2/3	n. 2/3	(1) 2/3	2/3½	2/3	2/-	2/3	2/6
New York to Liverpool (1) . . . . .	480 lbs.)	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Northern Range to U.K. and Continent . . . . .	(shill. per	n. q.	n. q.	n. q.	n. q.	n. q.	1/9	n. q.	1/9	1/9
North Pacific to United Kingdom (sh. per long ton) . . . . .	long ton)	n. 18/3	18/3	n. q.	n. 21/-	n. 21/-	n. 22/3	20/9	22/3	22/7
Vancouver to Yokohama (1) (gold \$ per sh. ton) . . . . .	(gold \$ per	3) 2.20	(3) 2.20	(3) 2.20	(3) 2.20	(3) 2.20	2.80	2.75	2.72	2.78
La Plata Down River (4) to U. K./Conti-	ment	13/-	13/6	13/-	14/6	15/2	16/3	9/7½	16/4	12/8
La Plata Up River (5) to U. K./Conti-	ment	14/6	15/-	14/3	16/6	16/11	17/11	11/1½	18/-	14/4
Karachi to U. K./Continent (6) . . . . .	(shill. per	n. q.	n. q.	19/10	n. q.	n. 21/6	19/-	15/10	18/3	n. 15/4
Western Australia to U.K./Continent . . . . .	long ton)	n. 20/-	n. 21/9	22/9	23/6	24/-	27/3	26/3	29/8	25/7
SHIPMENTS OF RICE.										
Saigon to Europe . . . . .	(shill. per	1) 21/6	22/3	22/-	22/-	22/-	25/7	n. q.	24/3	n. 18/11
Burma to U.K./Continent . . . . .	2240 lbs.)	1) n. 17/6	n. 21/-	(1) 17/6	n. q.	n. 23/9	21/10	20/11	23/9	n. 17/8

(1) Rates for parcels by liners. — (2) Freight in gold \$ per 100 lbs. (in the case of a loss of 25 % in the value of the shilling to \$ c. per 100 lbs. are equal to 2/8 per quarter). — (3) Freight in Can. \$ — (4) "Down River", includes the ports of Buenos Aires and La Plata. — (5) "Up River" includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight. — (6) The original data being quoted in "scale terms", 10 % is added to arrive at freights per long ton.

## EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY  
WITH THE DOLLAR (1).

COUNTRY	Exchange	June 17, 1932	June 10, 1932	June 3, 1932	May 27, 1932
Germany . . . . .	Berlin	—	0.4	—	0.4
Argentina . . . . .	New York	—	39.3	—	39.3
Belgium . . . . .	Brussels	+	0.2	+	0.6
Canada . . . . .	New York	—	13.9	—	12.1
Denmark . . . . .	Copenhagen	—	25.9	—	25.4
Egypt . . . . .	London	—	25.3	—	24.5
Great Britain . . . . .	London	—	25.3	—	24.5
France . . . . .	Paris	+	0.2	+	0.6
Indo-China . . . . .	Paris	+	0.2	+	0.6
Hungary . . . . .	Budapest	—	0.0	—	0.0
India . . . . .	London	—	25.5	—	24.8
Italy . . . . .	Milan	—	2.7	—	2.3
Japan . . . . .	New York	—	38.7	—	38.6
Netherlands . . . . .	Amsterdam	+	0.4	+	0.8
Rumania . . . . .	New York	—	0.0	—	0.0

(1) The percentage represents the premium or the loss as far as possible on the national exchange. By the aid of the table of reciprocal parities of the currencies considered and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Crop Report refer.

# RECIPROCAL PARITIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	Canada	United States	Denmark	Egypt	France	Indo China	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Rumania	Czechoslovakia	Former Latin monetary union (3)
Germany	Reichsmark	1	0.561	8.566	0.288	0.889	4.819	6.080	0.079	1.362	0.053	4.526	0.478	0.593	2.123	89.826	8.040	1.285		
Argentina	Paper peso	1.782	1	15.263	0.424	1.584	8.586	10.833	1.744	2.427	1.103	8.064	0.851	1.056	3.872	70.959	14.926	2.200		
Belgium	Franc	0.117	0.065	1	0.028	0.104	0.568	0.710	0.114	0.159	0.076	0.528	0.056	0.060	0.248	4.649	0.989	0.145		
Canada	Dollar	4.198	2.356	35.950	1	3.731	20.230	25.524	4.110	5.718	2.740	19.000	2.006	2.488	8.914	167.181	83.751	5.183		
United States																				
Denmark	Crown	1.125	0.681	9.687	0.268	1	5.422	6.840	1.101	1.532	0.734	5.092	0.538	0.607	2.389	44.803	9.045	1.389		
Sweden																				
Egypt	Piastre	0.207	0.016	1.777	0.049	0.184	1	1.262	0.203	0.283	0.135	0.989	0.089	0.123	0.441	8.264	1.668	0.256		
France	Franc	0.104	0.092	1.409	0.039	0.146	0.793	1	0.161	0.224	0.107	0.744	0.079	0.097	0.349	6.550	1.322	0.203		
Indo-China	Plastre (2)																			
Great Britain	Shilling	1.021	0.578	8.750	0.243	0.998	4.923	6.211	1	1.391	0.667	4.623	0.488	0.605	2.169	40.680	8.213	1.261		
Hungary	Pengő	0.734	0.412	6.280	0.176	0.658	3.580	4.464	0.720	1	0.479	3.923	0.351	0.435	1.559	29.240	5.903	0.906		
India	Rupce	1.592	0.860	13.125	0.305	1.362	7.334	9.316	1.500	2.087	1	0.935	0.732	0.908	3.254	61.020	12.319	1.892		
Italy	Lira	0.221	0.124	1.892	0.053	0.196	1.065	1.343	0.216	0.301	0.144	1	0.106	0.131	0.469	8.799	1.776	0.278		
Japan	Yen	2.092	1.174	17.924	0.498	1.860	10.054	12.723	2.049	2.850	1.399	9.471	1	1.240	4.443	88.333	16.824	2.588		
Netherlands	Florin	1.087	0.947	14.454	0.402	1.450	8.132	10.260	1.652	2.298	1.101	7.687	0.806	1	3.588	67.200	13.567	2.088		
Poland	Zloty	0.471	0.264	4.034	0.112	0.419	2.268	2.803	0.461	0.641	0.307	2.131	0.225	0.279	1	18.755	3.786	0.581		
Rumania	Leu	0.025	0.014	0.215	0.006	0.022	0.121	0.153	0.025	0.084	0.016	0.114	0.012	0.015	0.053	1	0.202	0.031		
Czechoslovakia	Crown	0.124	0.070	1.065	0.030	0.111	0.599	0.756	0.122	0.169	0.081	0.563	0.059	0.074	0.264	4.953	1	0.154		
Former Latin monetary union (3)	Gold Franc	0.810	0.455	6.988	0.103	0.720	3.903	4.925	0.798	1.108	0.529	8.666	0.987	0.480	1.720	32.258	6.512	1		

(1) Each figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) 1 Gold plastre equal to 10 francs. — (3) Data for purpose of comparison.

# AGRICULTURAL SCIENCE AND PRACTICE



# MONTHLY BULLETIN

## OF

### AGRICULTURAL SCIENCE AND PRACTICE

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#### GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

##### Factors Influencing the Quality of Ensilage.

Where ensilage is widely used emphasis is inclined to be laid on the losses involved rather than on possible improvements in the process.

Certain fodder crops are not well suited to making into hay on account of the fragility of the leaves, as is the case with lucerne, or they suffer considerable losses during curing. It has been shown at the Missouri Experiment Station that maize loses 15.12 % of dry matter when it is cured in the field, whereas in silage it loses only 4.01 %.

For ensilage of green fodder to be genuinely economical the two following principles must be observed :— loss of useful elements must be avoided to the greatest possible extent and the quality of the product must be improved. Ensilage has in the past, in the absence of exact knowledge, been made on empirical methods, with the result that the product has been of varying quality, but a considerable amount of experimental work has now made it possible to state that the factors determining its quality are known.

These factors will be briefly discussed below leaving out of consideration the question of the micro-organisms.

(1) *Choice of crops for ensilage.* — Most meadow grasses make good ensilage, but in regions where silage is much used, either on account of difficulties in hay-making (wet regions) or of shortage of green fodder in summer (arid regions), it is advisable to select the fodder crop which will yield the best ensilage as regards feeding value and palatability. Maize ensilage is a valuable feed, equivalent to fresh maize. Maize is also the crop which loses least dry matter in the silo : according to a recent experiment in America silage losses for maize are 4 % as against 18 % for other fodder crops. Maize is however an incomplete food, being deficient in protein and minerals ; it is therefore necessary in filling the silo to mix in other crops, preferably legumes such as soybean, clovers or vetches. The clovers and lucerne do not contain sugar and so alone make a poor quality ensilage deficient in acidity. In colder regions ensilage is made with sunflower, but its nutritive value is still disputed. Other materials such as beet pulp and tops, millet, peas, etc. are also used. By a suitable mixture of these varied crops an ensilage can be made for any particular purpose (for sheep, dairy cattle, fat stock, etc.).

(2) *Moisture content of fodder for the silo.* — The degree of moisture affects the quality of the resulting ensilage and varies with the plant and the time of harvesting. Maize should be cut about 10 days before it reaches complete maturity, when it will contain from 65 to 70 % water, which is adequate moisture for silage.

If maize is cut too ripe water must be added, but then the flavour of the ensilage will be less good. Lucerne makes good ensilage when its water content is between 50 and 70 %; above 70 % of water spoils the flavour and odour.

Ensilage can be classified according to the moisture content of the fodder into 3 classes with characteristic colours and odours:—(1) dark brown, aromatic ensilage obtained by rapid fermentation of fodder with a moisture content of 60 to 70 %; (2) light brown (first crop hay) or greenish brown (second crop hay) ensilage obtained from grass with a moisture content of 70 to 80 %; (3) olive green ensilage with a nauseous butyric odour obtained from grass with a moisture content of over 80 %.

(3) *Temperature of ensilage.* — The quality of the ensilage depends largely on the temperature of fermentation in the silo. It is necessary to avoid acetic fermentation, which takes place at 15° to 25°C, and butyric fermentation at about 40°C, and to obtain lactic fermentation at about 50°C. This is obtained with fodder containing 60 to 70 % of water. In addition to the moisture content another factor affecting the temperature of fermentation is the temperature of the outside air during the filling of the silo. But one of the most important factors influencing temperature variations is the total air content of the fodder. The presence of air raises the temperature considerably as has been shown at the Experimental Station of the University of Missouri. Early in September 1916 2 silos were filled with the same maize; in the first silo the maize was thrown in without care and without any application of weight; in the other the maize was well stacked and a weight of 700 kg applied; a thermometer was placed in the centre of each silo. On 15 January the silos were opened. The top of the first silo was completely rotted, while in the second there was only a thin layer of mould; the thermometers showed that the maximum temperature in the first silo had been 12.75° higher than the maximum temperature in the second; this was undoubtedly due to the presence of air. To get rid of the air it is essential to cut the fodder into short lengths and to stack it well. This is particularly necessary in the case of cereals which hold much air in their hollow stems. It has however been shown by recent experiments at Beltsville (U. S. A.) that ensilage of maize cut at the stage of maturity indicated above need not be carefully stacked.

The materials of which the silo is built, its type and capacity have little influence on the quality of the ensilage as far as can be judged from its appearance and chemical analysis.

(4) *Position of fodder in the silo.* — The quality of ensilage depends to some extent on the part of the silo from which it comes. In a vertical silo the richest ensilage is found at the bottom, because it contains soluble nutritive matter carried down by the juices from above. This was proved by an experiment at the South Eastern Agricultural College at Wye (England) in 1921. Ensilage was taken from various depths in the silo and separately analysed; it was found that the samples taken from the upper half of the silo had lost an average of 32 % of their content in ether extract and 17 % of the soluble constituents of the ash; the samples from the lower half had gained 6 % in ether extract and 2 % in soluble constituents of the ash in comparison with their initial content. This experiment also shows that a considerable proportion of the soluble constituents is carried away in the juices and lost from the fodder. The drainage juices contain a considerable quantity of nitrogenous and mineral matter, the loss of which is serious when the ensilage is to be used as a feed for dairy cattle, which require a supplementary ration of lime, phosphorus and potash. According to an experiment carried out in 1923

at the Rowett Research Institute (Aberdeen) the loss of mineral matter may be as high as 2 % of the total content in the green plant. The losses can be reduced to the greatest extent possible by placing the driest fodder at the bottom of the silo and the youngest and most sappy above. It has often been said that ensilage from the outside of the silo is of poorer quality than that from the centre. This is the case only if the walls of the silo are not air-tight or if the fodder has not been well distributed at the edges.

D. KALTENBACH.

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**Miscellanea.**

I. — GENERAL AGRONOMY.

Meteorology.

LIGHTNING FROM A CLEAR SKY. — On January 20, 1931, in Tatoosh Island (U. S. A.), between 4.17 a. m. and 4.32 a. m. 6 or 8 flashes of lightning were observed overhead and slightly toward the north. The sky was clear with about 2 strato-cumulus clouds along the horizon from SW-NW. At 5.15 a. m. another flash occurred in about the same position as the others.

Light rain had been falling during the night, ending about 2.45 a. m., the sky clearing by 4.0 a. m. The lightning appeared to flash across the sky and not to the ground. No thunder followed the flashes.

This is the first time lightning has been observed from a clear sky at the station on Tatoosh Island, which is situated off the coast of Washington State. (*Monthly Weather Review, Washington 1931, Vol. 59, No. 1, p. 39.*)

RADIUM EMANATION IN THE ATMOSPHERE NEAR GRAZ, STYRIA : SEASONAL VARIATIONS. — Research carried out by M. Ekkehard SCHMID at St. Peter, near Graz, has shown that the content in radium emanation of the air follows an annual course. During January and February it diminishes to its minimum in March, after which it rises sharply until July when the maximum is reached. From August it again diminishes gradually until the following March.

It is noteworthy that the minimum occurs in early spring at the time of maximum soil humidity, while the maximum emanation is in July when the temperature is at its maximum, the sky freest from cloud and the ground particularly dry. (*Meteorologische Zeitschrift, Braunschweig 1931, Heft 5, p. 180-186.*)

T. B.

## Soil Science.

PREPARATION OF SOIL SAMPLES FOR MECHANICAL ANALYSIS. — An exhaustive comparative study of the different methods used in this important preliminary treatment of soils for mechanical analysis has been carried out by Prof. I. C. DRAGAN (*Landwirtschaftliche Jahrbücher*, Berlin 1931, 74. Band, Heft 1, p. 27-46).

In the preparatory treatment one is dealing with a reversible process, for the separation of the soil particles is continuously opposed by a process of coagulation. In order to break the equilibrium which is constantly being reestablished it is necessary to remove the dispersed particles and repeat the preparatory treatment.

There are no 'normal methods' of preparation in the sense of Sven ODÉN, because in different soils the aggregation of particles tends to occur in different ways; their separation (preparation) therefore must be effected by different methods.

The methods compared were the following:—

(1) *Boiling and friction*. The soil was boiled for 2 hours in 10 to 20 times its weight of water, then after cooling the fine fractions were decanted in the ATTERBERG cylinder and the remaining soil pounded for 5 minutes with a rubber pestle before being put into the cylinder.

(2) *Friction*. The soil sample was steeped in water for 24 hours, pounded for 5 minutes and then put into the cylinder.

(3) *Hissink agitation method*. The soil is steeped for 24 hours in distilled water, agitated for 6 hours at a rate of 240 revolutions per minute, then put into the cylinder.

(4) *Robinson method*. The soil is heated in a water bath with hydrogen peroxide for 30 minutes, then for a further 20 minutes after another application of  $H_2O_2$ . In the case of calcareous soils the carbonate is dissolved with dilute HCl before oxidation.

(5) *HCl treatment and boiling*. After elimination of carbonates with 0.2 N HCl the soil is steeped for 24 hours, then the HCl is neutralised and the soil boiled and pounded.

(6) *HCl treatment and pounding*. Similar to the preceding but repeated pounding with a rubber pestle instead of boiling.

(7) *International method A*.

Repeated treatment with  $H_2O_2$  (unless the soil is very poor in humus) and heating in a water bath. Elimination of  $CaCO_3$  with dilute HCl, then sedimentation in the ATTERBERG cylinder with the addition of  $NH_3$ .

(8) *International method B*. Steeping for 24 hours, then boiling in distilled water for 2 hours or pounding or agitating. Decantation of the liquid into the ATTERBERG cylinder. Repeated pounding of the remaining soil with a rubber pestle and decantation until only sand remains in the mortar.

The results obtained were as follows:—

(1) Preparation by physical methods gives differing results according to the soil content in electrolytes. In comparison with other physical factors boiling produces better dispersion when the soil suspension is poor in electrolytes and the particles have a charge above the critical potential. The agitation method in such a case gives similar results. But when the soil is rich in electrolytes boiling causes more coagulation than the other methods, with the result that the clay content obtained is lower than with the agitation methods and even, in certain soils, than with the simple pounding method.

(2) Preparation with chemicals to eliminate electrolytes and humus causes the soil particles to become charged above the critical potential and prevents their coagulation.

(3) Soils poor in lime and humus should be prepared by the boiling or agitation methods. Soils rich in lime and humus should first be treated repeatedly with cold 0.2N HCl in slight excess, then boiled and pounded several times. Only in exceptional cases should soils rich in humus be prepared by the international method A.

(4) Soils with or without lime and humus may be prepared by the agitation method if mechanical analysis is to be effected by a method other than that of ATTERBERG, such for instance as that of KÜHN, KÜHN-WAGNER, KOPECKY or SCHÖNE, which determines not the crude clay ( $< 0.002$  mm) but the impalpable particles ( $< 0.02$  or  $0.01 < 0.01$  mm).

(5) It is beneficial, particularly with physical methods of preparation, to allow the soil samples to steep in distilled water for 24 hours.

SOIL STERILISATION. — A bulletin issued by the Ministry of Agriculture and Fisheries (Bulletin No. 22, *Practical Soil Sterilisation, with special reference to glasshouse crops*. London 1931, 23 pp., illust.) gives valuable information on the various methods and



plant used for partial sterilisation of soil to increase its fertility as well as to destroy harmful microorganisms.

Sterilisation may be effected by (1) steam introduced into the soil until the required temperature is reached at a certain depth ; (2) dry heat, baking the soil in a furnace or other container ; (3) antiseptic liquids, such as cresylic acid, formalin, etc.

*Comparison of the three methods and their results.* — There has been much discussion of the rival merits of sterilisation by steaming and by baking. Both methods are good if well applied ; the soil is increased in fertility by the transformation of complex organic and inorganic substances into simpler forms which are either directly available to plant roots or are rapidly converted into plant foods by certain heat-resistant bacteria which are not destroyed by the treatment. Sterilisation also allows these useful bacteria to multiply freely in the absence of competing organisms. Both methods destroy disease-causing fungi and bacteria.

Steam treatment has become the most popular, for it is effective, relatively economical and allows of the sterilisation of large quantities of soil.

Baking is less used for the following reasons :— (1) It is more costly than steam heating and cannot be used for soil in large bulk. (2) It has a more powerful action on the organic matter of the soil and modifies more its physical properties, so that baked soil is less suitable for pot culture owing to its drying out more rapidly. (3) There is risk of overheating the soil and making it thus unsuitable for plant growth. (4) Baked soil must be kept at least 6 weeks before use.

Steam treatment is sometimes accused of transforming the soil into a thick mud, but if this occurs it is due to a wrong application of the method. On the other hand with this method there is no risk of over-heating the soil, unless dry superheated steam is used.

Where the necessary appliances for either of these methods are not available the soil may be sterilised with the antiseptics mentioned, but they are genuinely effective only if they come into contact with all parts of the soil. They are therefore not successful with heavy soils.

Cresylic acid and formalin should be mixed before application with sufficient water to eliminate causticity.

A tomato-house soil was used for the comparison of sterilisation by steam with sterilisation by chemical agents. The effect of different treatments upon the tomato crop in 2 series of experiments is shown in the following table :—

Treatment	Relative yield	Treatment	Relative yield
Steam . . . . .	180	Steam . . . . .	185
Cresylic acid . . . . .	154	Formaldehyde . . . . .	119
Other liquid sterilisers . . . . .	114	Cresylic acid . . . . .	106
Control . . . . .	100	Control . . . . .	100

Steam treatment thus gave better results than the application of liquid antiseptics. Steam treatment, moreover, need not be repeated oftener than every 4 years.

For the success of soil sterilisation every precaution must be taken to avoid reinfection by contact with non sterile soil.

T. B.

## Fertilisers.

**DETERMINATION OF PLANT NUTRIENT DEFICIENCIES.** — An abstract of a paper on this subject presented by PERTINGER and ELLETT at the 82nd meeting of the American Chemical Society (Buffalo, 1931) is given in *The American Fertilizer* (Philadelphia 1931, Vol. 75, No. 6, p. 17).

Gross analyses of soils is of no value in diagnosing the immediate nutrient needs of the soil because it does not distinguish the available nutrients from those that are unavailable. Partial extraction methods are of doubtful value because their efforts to extract only the available nutrients are not entirely satisfactory.

Plant ash analyses are of some value in detecting nutrient deficiencies over extensive soil areas, but cannot be relied on to reflect the fertilizer needs of any particular soil sample. Analysis of the plant sap seems to offer a promising means of detecting nutrient deficiencies. Critical sap concentrations for the nitrogen, phosphorus and potassium needs of maize are given by the writers.

The HOFFER stalk test and the NEUBAUER seedling method are rapid methods that are being widely used. The former is a field test used to detect nitrogen and potassium needs in the maize plant, while the latter is a laboratory procedure for determining phosphorus and potassium needs through rye seedlings.

Pot tests and field trials with fertilisers are naturally the most popular methods. The latter is considered to be the more accurate because the soil, fertiliser and plant are all operating under natural conditions.

Judging acute nutrient deficiencies by the symptoms of distress shown by plants will probably become a very useful method. Its main limitation is its failure to indicate partial deficiencies.

The vegetative covering of the soil is a useful guide to lime needs.

Two bacterial methods, the nitrification and *Azotobacter* tests, are discussed. The former determines the nitrifying power of soils and their capacity to supply nitrates to crops, while the latter is a rapid method for detecting lime, phosphorus and potassium needs.

**VOLATILISATION OF POTASH FROM POTASSIUM AND ALUMINIUM SILICATES.** — As a source of agricultural potash the large deposits of potassium and aluminium silicates, such as greensand of New Jersey, Delaware, Maryland and Texas, leucite of Wyoming, shales of Georgia, and feldspar distributed through the industrial eastern and agricultural southern United States, are valuable in so far as their potash can be extracted economically. The extraction methods attempted in the past were rather along the line of reaction by means of acids or salts in an aqueous solution, or of high temperatures in a blast furnace or rotary kiln.

In a series of 135 cases it is shown that the potash can be successfully extracted from the potassium-aluminium silicates by means of a combination of  $\text{CaCO}_3$  and  $\text{CaCl}_2$  at temperatures from 1200-1500°C. It was found that a cement mixture is obtained which when treated in an ordinary rotary kiln results in a Portland cement. The potash comes off as  $\text{KCl}$  vapour and can be collected by means of a precipitator. The yield of  $\text{K}_2\text{O}$  varies from 11.51 pounds per barrel of cement produced, in the case of greensand, to 22.23 pounds per barrel in the case of Wyoming leucite.

**INFLUENCE OF SODIUM HYPOSULPHITE ON PLANT GROWTH.** — According to LEON BINET and J. MAGRORE (*Comptes rendus de l'Académie des Sciences*, Paris 1931, tome 193, n° 2, p. 115) hyposulphite of sodium in 1 per 1000 solution has an appreciable activating effect on the growth of cress (*Lepidium sativum*). The weight at 8 days after sowing of a lot of seedlings treated with this solution was 49.5 gm, whereas untreated seedlings of the same age weighed 36 gm. At higher concentrations however the salt had no, or even an injurious, effect. At 100 per 1000 plant growth was nil, at 10 per 1000 insignificant, at 5 per 1000 less than in the control lot.

Hyposulphite of soda did not appear to promote the growth of peas (*Pisum sativum*) or of lentils (*Ervum Lens*). Seeds of these species treated with a 1% solution gave plants practically equal to the controls; with more concentrated solutions the growth was less than in the controls.

**IODINE FERTILISERS.** — A review by VERONA in the *Italia agricola* (Piacenza 1931, anno 68°, n. 7, pp. 462-465) of the work on iodine-containing fertilisers states that up to the present their use has not been found practical and cannot be recommended.

**INFLUENCE OF SILICA ON PLANT NUTRITION.** — A summary of the results of research on this subject carried out by DEUSCH and STEINFATT is given in *Fortschritte für Landwirtschaft* (Berlin-Wien 1931, 6. Jahrgang, Heft. 11, p. 353-359) as follows:—

(1) Colloidal silica may, in certain soils cause a better utilisation of the phosphoric acid by seedlings.

(2) In soils rich in colloids such an action by silica can scarcely be expected, and in pure sand heavy applications of silica may even injure plants causing them to absorb too much.

(3) To obtain an action by colloidal silica larger quantities are necessary than can be applied in field practice.

(4) Preparations of non-colloidal silica, even of extreme fineness, had no appreciable effect.

LIMING OF SILTS AND DECALCIFIED CLAYS. — A discussion of this subject is given by H. RICHARD in *La Potasse* (Mulhouse 1931, No. 44, pp. 117-119; No. 46, pp. 148-150).

The old marling practice consisting in applying for 25 to 30 years 30 to 40 tons of unscreened and more or less impure marl per hectare is not recommended unless the marl is readily accessible and of excellent quality. A method which is better as well as being more suited to short modern leases is to apply pure finely crushed chalk at a mean rate of 10 tons per hectare for 10 years. Chalk may with advantage be replaced by defecation scums, where these are available, at a rate of 20 tons and upwards per hectare. These scums are excellent for breaking up even the most heavy soils.

This land improvement marling should be followed up by light dressings of lime to replace annual losses, which are equivalent to 480 kg of CaO or 800 to 1000 kg of crushed chalk per hectare. The annual dressing should be 2 to 3 tons of screened rich lime, as pure as possible, to the hectare. Heavy dressings of 5 or more tons per ha are advisable only for very sticky and heavy soils.

Transport costs should be avoided as far as possible by using local lime supplies.

Lime and marl should not be applied on the same scale. Lime has a more rapid but less lasting action (2 to 3 years) and repeated dressings may fatigue the land. The action of marl or chalk may last 10 or 20 years, is absolutely harmless and they may be applied at any time on cropped or fallow land.

Lime should be dug in if only to a few inches, as soon as spread, because in the air it is converted to the carbonate without having the desired reaction throughout the arable layer.

Marling and liming activate the soil and should naturally be accompanied by appropriate fertilising.

T. B.

### Ecology.

DROUGHT COMPLICATES THE STORY TOLD BY THE TREE RINGS. — It is reported by the United States Forest Service that in 1930 the time-honoured method of telling the ages of trees by the annual rings has been upset. In most regions trees started growth normally in spring but were checked by the parching summer drought. Almost everywhere the growth of trees was slight but in some areas where late summer rains soaked the earth, a second period of growth followed the drought and so altered the ring records. This was the case in Alabama. As a consequence of the check and the new advance in growth Alabama trees in many cases put on a second thin layer, known to foresters as a 'false ring'. So the foresters of future years will have to be on their guard in computing ages in the living calendars of Alabama tree stumps. Such false rings are not uncommon over long periods of years.

The normal growth ring showed less thickness than usual and even in those regions where growth was renewed late in the season the second ring did not result in a larger total year's growth. Most regions however did not get rain early enough to start the second ring.

These facts are of interest not only to foresters but on account of their ecological value in the application of the well known method of reconstructing the weather of the past by the state of the annual rings of tree trunks. For this reason this note has been reproduced from the *Monthly Weather Review*, 1931, Vol. 59, No. 2, p. 82.

T. B.

### ANIMAL HUSBANDRY

#### Feeding and handling of fattening cattle in the United States. (Recent developments).

In a previous article (1) the problems of the beef fattening industry have been discussed in so far as the animals used for the purpose are concerned. The present article will give a rapid review of the other side of the problem, the question of the feeds which are given to fattening cattle and of their distribution in the different regions of the country.

In no field of animal industry perhaps has more research work been carried on

(1) Cf. this *Bulletin*, 1931, Nos. 5 and 8.

and have more results been obtained in recent years than in this. This may be due to the general opinion that in no other field would research yield quicker and more important practical and economic results.

The general question with which all these efforts are concerned is the most suitable ration to give to fattening cattle in order to obtain the highest possible profit.

Generalisation will never be possible on this question. The most suitable ration depends on a series of factors of both technical and economic order. It depends in the first place upon the cattle fattened, its age, grade, breed, sex and type; it depends upon local conditions, upon the kinds of feed available in a district, upon the way feeds are distributed to the animals and to a large extent on the prices of feeds and of beef at the slaughter.

As most of these factors vary according to time and locality, the results reached with various rations and various feeds will also differ. Even within relatively small areas the conditions and therefore also the method of feeding differ.

It has been shown in a previous article that cattle fattening is mainly concentrated in the so-called Corn Belt, formed by the five States Iowa, Nebraska, Illinois, Indiana and Missouri. The main crop of this region is corn, as the name implies. It is therefore evident that the main food used in fattening cattle will also be corn. But even within this region the quantities of corn used differ to a large extent and depend on the quantities of other feeds available.

In Nebraska and Iowa alfalfa is plentiful and great quantities of alfalfa hay are used; thus largely on account of this fact, smaller quantities of protein concentrates and less silage, corn stover and straw are fed in these districts than in other districts of the Corn Belt. In Illinois and Indiana, where usually less legume hay is available, more mixed hay, timothy, corn stover and straw, and decidedly more protein concentrates, are used. About one-fourth of the corn given to cattle in Illinois and Indiana is fed in the form of silage, while in Nebraska and Iowa practically all of the corn is fed as grain. In Missouri grass pasture is more important: considerable quantities of protein concentrates and prepared feeds are usually fed to cattle in this State and considerable quantities of corn stover and silage are used.

Table I shows the quantities of feed used in the five Corn Belt States to produce 100 pounds of gain in live weight, according to an enquiry made by the U. S. Department of Agriculture.

TABLE I. — *Quantities of feed consumed per 100 pounds of gain  
in five years average  
(in pounds).*

	Number of cattle considered	Grain	Protein concen- trates	Prepared feeds and molasses	Legume hay	Other hay	Stover and Straw	Silage
Nebraska . . . .	17,162	817	3	2	378	52	10	42
Iowa . . . . .	23,144	845	7	15	203	40	54	163
Illinois . . . . .	20,004	590	41	7	126	130	128	1,612
Indiana . . . . .	16,694	683	33	15	49	37	280	1,139
Missouri . . . . .	24,310	602	33	24	125	43	166	420

The pasture period has been in this enquiry 11 days in Nebraska, Illinois and Indiana, 14 days in Iowa and 41 days in Missouri.

As can be seen from Table 1, as more protein concentrates and prepared feeds are fed less legume hay is available. In these cases greater quantities of stover, straw and silage make up the roughage.

The proportions of different feed given in a fattening ration for cattle within a given locality largely depend on the prices of the foodstuffs.

There are two different methods of fattening beef cattle: fattening on grass is used where enough pasture land is available, while fattening in the dry lot is more common in the districts where there is less grassland. In the Corn Belt dry lot fattening is the more common method.

Of the cattle considered in the above mentioned enquiry in the Corn Belt 59 % were fattened on grass, in Missouri however less than 8 % of the cattle were handled in this way.

Two methods of fattening can also be distinguished on the quantities of food given to the animals: *full feed* and *limited feed*. In Missouri some tests indicate the advantage, in the case of cattle of good quality, of a full feed of grain, as soon as they can safely be got up to a full feed, rather than limiting the amount of grain fed during the fattening period. In Minnesota the method of limiting the allowance of concentrates to only 2 pounds per head per day during the first half of the feeding period proved much less profitable than full feeding of grain throughout. In Arizona, however, calves receiving silage, limited in proportion to the alfalfa hay consumed, very slightly excelled the calves fed unlimited silage in average daily gain, in cost of gain and in margin necessary to cover costs.

Provided calves are up to practically a full feed of concentrates, *self-feeding* has proved more profitable than *hand feeding* in Kansas. Also trials in Minnesota indicate that the self-feeder may be used to advantage to feed the grain to fattening calves if a full feed of grain is to be fed.

The question whether dry *roughage* or *silage* is the more profitable also depends mainly on the locality and time. In Arizona dry roughages can be fed to best advantage early in the fall, particularly to cattle just off the range. For later feeding, silage is more profitable.

The main roughage used throughout the United States in the cattle fattening industry is *alfalfa hay*. It is considered of high value especially because of its protein and mineral content. Greater returns of beef per acre were obtained in California when alfalfa hay was fed with a full grain ration than when silage and alfalfa were fed with a full grain ration. Alfalfa is somewhat more palatable even than *sweet clover* and cattle under similar conditions consume a larger amount of alfalfa hay and produce slightly larger gains. Because of the higher percentage of calcium and protein in alfalfa hay and the higher need of calves for calcium and protein there is also a difference in favour of alfalfa hay compared with *Sudan hay*.

In Montana steers can be fattened satisfactorily on *mixed hay* grown in the State. In Minnesota *sweet clover* has been substituted for alfalfa hay with fairly satisfactory results in rations for fattening two-year-old steers. *Wild oat hay* when fed with sufficient cottonseed meal has proved in California to be almost equal to alfalfa in the production of gains and finish. Wild oat hay however only contains about 4 % digestible protein, while alfalfa hay contains about 12 %. No advantage has been secured by chopping wild oat hay, and equal parts of alfalfa and wild oat hay seemed no more efficient than either kind of hay alone.

In the South-Western States *cane hay* and *kafr hay* are much used as roughage. Cane hay seems to be somewhat more efficient than kafr hay. Throughout the whole Cotton Belt *cottonseed hulls* are very much used in feeding cattle; they have feeding value approximately equal to oat straw. Because of the nature of this feed

and the ease with which it can be mixed with grain or cottonseed meal larger quantities are consumed and better results are obtained than on a ration of cottonseed meal and straw.

Using other kinds of hay than alfalfa the ration is generally lacking in calcium. The addition of approximately one-ninth of a pound of *calcium carbonate* to a ration consisting of prairie hay, cane silage, shelled corn and cottonseed meal produced, however, in Kansas even slightly greater gains at less cost per hundred pounds than the same ration with alfalfa hay.

A net return of 4.20 dollars per steer was given by 20 cents worth of calcium carbonate. Adding limestone to a ration made up with prairie hay seems to make the ration nearly as valuable as the same ration with alfalfa hay. It is however useless to add ground limestone to a calf fattening ration in which the entire roughage portion is made up of alfalfa hay. In California the addition of calcium carbonate in the form of ground oyster shell did not increase the efficiency of a ration of wild oat hay, rolled barley and cottonseed meal.

All over the United States *silage* is a very important food for fattening cattle. In the Cornbelt, as show the results of the above mentioned enquiry, 42 % of all cattle that were finished in dry lot were fed silage. This percentage reached 85 % in Illinois but was as low as 2 % in Nebraska. The quantity of silage fed depends on the amount of legume hay and other dry roughage available, on the price of corn and the danger of frost to immature corn. Silage is even used as the entire roughage portion, and the use of a dry roughage did not prove necessary if the ration is otherwise well balanced. For heavy cattle more than 30 pounds are fed; for medium weight 25 pounds, for calves 15 pounds. The adding of silage to alfalfa hay seems to increase the rate of gain and when the hay is high priced it gives more economical results than where hay is fed alone.

In Wyoming the use of silage in such large quantities as half the roughage on a dry matter basis did not prove quite as economical as native hay and cottonseed meal alone.

*Corn silage* is the kind of silage most used in the United States and especially in the Corn Belt. It is used in the maintenance, growth, and fattening of beef cattle under a wide variety of circumstances, frequently forming the most economical portion of a ration. The amounts given to calves vary between 10 and 50 pounds per day; depending on the amount of grain and other roughage fed. In Minnesota the addition of corn silage to a ration of grain and legume hay proved however to be unprofitable. In Colorado however corn silage is used with advantage to supplement wet beet pulp in a beet by-product ration for fattening calves. The pulp requirements were reduced by nearly one-half by 6.3 pounds of corn silage fed daily.

In the Southwestern States *sweet sorghum silage* and other kinds of silage are frequently used. In Arizona sweet sorghum silage as compared with sweet sorghum fodder gave better results in every way. *Sunflower silage* was not relished as much nor gave as good results as did the sweet sorghum silage. The results with sunflower silage were not unfavourable. Also in Montana sunflower silage seemed to be a valuable addition to the ration as it usually takes 3 pounds of silage to equal 1 pound of alfalfa hay. In Arizona a comparison between *hegari silage* and corn silage did not reveal any material difference between these two feeds. In Arizona also *Papago sweet corn silage* and *Red Amber sorghum silage* are used in fattening cattle. In Kansas one acre of *kafir* fed to yearlings in the form of silage produced 2 or 2 ½ times as much gain as the same kind of *kafir* cured and dry in the form of stover when each is supplemented with 1 pound of cottonseed cake

per head per day. Frequent changes in the kind of silage fed seemed to give the cattle a setback.

Although silage has proved to be the most advantageous form of feeding of cereal plants, stover is also very much used in the fattening ration as roughage. In the Corn Belt *corn stover* is generally used, while in Kansas and in the South-western States *kafir, cane* and *hegari* stover and fodder are fed.

In the Corn Belt, where *corn* is plentiful, no problem arises as to the fattening *carbohydrate feeds*. In the Cotton Belt, however, in California and in other regions, the question of the supply of grain is more difficult to answer. In the western States *barley* is very much used in the feed for fattening cattle. In Minnesota however shelled corn proved much superior to ground barley as a feed for fattening beef calves; it produced slightly higher average daily gains and a somewhat higher degree of finish. With the price of barley at 55 cents per bushel and corn at 75 cents, the barley-fed calves returned nevertheless a larger margin of profit. In California *ground yellow corn* fed with alfalfa hay produced a lower rate of gain but a higher finish than barley and alfalfa hay. In Minnesota better results were obtained from feeding *corn-and-cob-meal* than from shelled corn and whole oats. Mixtures of *small grains*, such as *barley and oats* can be used satisfactorily in fattening cattle in Montana. These grains should always be rolled, crushed or ground. They produce nearly as high gains as corn and alfalfa. Heavy cattle are successfully finished on barley as the only grain when fed with a protein supplement in a ration of sweet clover or alfalfa hay in Minnesota. Ground barley alone proved to be a more satisfactory grain in fattening baby beef than *ground oats*. Replacing one-half the barley ration with an equal weight of oats did not improve the ration. The addition of oats to a ration of shelled corn, linseed meal, corn silage and alfalfa hay, decreased the gain and lessened the profit. In California *barley, milo, kafir* and *feterita* have proved to be almost as valuable as corn for fattening cattle. When kafir is fed in the form of silage, or dry cured after the kafir plant has reached full maturity and produced a heavy grain crop,  $1/2$  or  $2/3$  of the feeding value of the kafir silage or fodder lies in the seed.

Because of its greater growth and yield of grain, *hegari* is generally preferred to corn in Southern Arizona as a grain and silage crop.

*Grinding shelled corn and oats* for baby beeves did not prove profitable in Minnesota. *Small grains* should however be *ground or rolled* for cattle feeding as shown by trials in California. Under Arizona conditions it was not advisable to *head, thresh and grind the hegari grain* in finishing cattle for market.

In districts where the beet sugar industry is developed the by-products are of great importance in the cattle fattening industry. Beet tops, wet beet pulp and beet molasses are excellent feeds for fattening cattle. *Dried sugar beet tops* showed a feed replacement value of 6.41 dollars per ton of tops fed in Colorado. In the same State a standard beet by-product ration of *wet beet pulp*, barley, cotton cake and alfalfa proved cheapest and most efficient for fattening calves in beet growing areas. The relative efficiency of wet beet pulp siloed at the factory and *pressed beet pulp* at the farm depends largely on the comparative length of time the pulp is stored. *Siloed beet pulp* proved more economical in Colorado, all costs considered, than pressed beet pulp. In California great amounts of *molasses* are fed. They proved to replace approximately an equal amount of barley in the ration and are almost equal to corn in food value, when fed in amounts not exceeding 5 or 6 pounds.

While in the Cotton Belt *protein concentrates* are supplied in the form of the by-products of the cotton industry at a very cheap price, in other parts of the United

States, and especially in the Corn Belt, the question of the most appropriate protein concentrate to use in a ration for fattening cattle is still a subject of discussion. There are three of these concentrates used in great amounts in the fattening industry : linseed oil meal, corn gluten meal and cottonseed meal.

According to trials carried out in Kansas the value of these feeds on the basis of ultimate profit, and allotting 100 to linseed meal, is for corn gluten meal 77.79 and for cottonseed meal 76.02. The use of these concentrates, which in the northern States are rather expensive, depends largely on the amount of alfalfa hay available. In Montana the addition of cottonseed cake or linseed cake to a grain and alfalfa hay ration seems not to be justified and is not recommended, except for the production of baby beef. In Minnesota profits in fattening baby beef were increased by the addition of *linseed oil meal* to a ration of ground barley, corn silage and alfalfa hay. Linseed oil meal proved to be a more satisfactory protein supplement than *corn gluten feed*. In Kansas linseed oil meal gave also a higher profit than cottonseed meal. *Cottonseed products* being the cheapest protein supplements in the country are used liberally as supplements in the fattening of cattle both on grass and in the dry lot. Cottonseed cake is frequently but not advantageously used as the sole supplemental feed, but more often cottonseed meal or cake is used in a mixture with corn or other grain. The constituents for which alfalfa is most valuable — protein and calcium — may be secured practically as satisfactorily from an increased amount of cottonseed meal or other protein supplemental feed and ground limestone.

When no legume hay is fed 4 pounds of cottonseed meal per 1000 pounds of live weight are given as protein supplement. In California the addition of one pound of cottonseed meal to a ration of alfalfa hay and rolled barley increased the gains and finish slightly, but not sufficiently to be profitable with the usual difference in price of barley and cottonseed meal. In Wyoming cottonseed meal proved superior to old process linseed meal with fattening two-year old steers. The limiting factor in full feeding cold pressed cottonseed cake to calves is however the possible danger of cottonseed poisoning. During a trial in California two animals out of 10 showed acute symptoms of cottonseed poisoning after being on a ration of cottonseed hulls and meal for 112 days.

In California also *coconut meal* is often used as fattening food. It contains about half as much protein as choice cottonseed meal, but if its price is equal to or less than the price of barley it can be used to replace, pound for pound, one-half the barley in a fattening ration for baby beeves.

*Raisin pulp* and *orange pulp* have been tried as cattle feeds in California. Raisin pulp seems to have a feeding value equal to two-thirds that of rolled barley. It is however low in digestible protein and requires therefore a larger amount of protein supplement than barley. Dried orange pulp should have a feeding value approximating that of barley, dried beet pulp and other feeds of a similar nature.

A general conclusion on the question of the most appropriate ration cannot be given. The ration will always depend on local conditions. But considering the whole country it may be said that the United States are divided into three distinct territories as regards feeding practice :—

(1) *the Corn Belt*, where the question as to roughage and grain is solved, the roughage being supplied to the largest extent by alfalfa hay, corn silage and corn stover, the grain being mostly corn in its different forms. The question as to the most appropriate protein supplement is however still under discussion and whether linseed oil meal, cottonseed meal or corn gluten meal is the most profitable depends on time and locality ;



(2) *the Cotton Belt*, where there is a lack of alfalfa, roughages in general and corn silage or stover of small grain plants, such as kafir, hegari, sorghum is mostly given to cattle. On the other hand, the protein supplement is no problem owing to the abundance of cottonseed by-products.

(3) *California*. Here the carbohydrate feeds are largely furnished in the form of small grains, mainly barley; there is no lack of roughages as alfalfa is very much grown, while the cotton industry furnishes plenty of cheap protein concentrates in the form of cottonseed cake and meal.

No general rule as to the relative value of the different feeds can be laid down. The question whether a foodstuff is more or less profitable depends on the locality and on how it is used.

S. TAUSSIG.

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**Miscellanea.**

General.

TENDENCIES IN AMERICAN LIVESTOCK BREEDING. — Some very interesting hints on the recent tendencies in livestock breeding in the United States are brought out by A. H. SANDERS in an article in the *Breeders Gazette* of March, 1931. SANDERS complains in the first place that much too great importance is given to wheat in considering American agriculture. To read the speeches of Senators and the reviews of economic conditions issued by various big banks one would say that there is nothing else grown on the farms of the United States worth talking about except wheat. (This is true not only for the United States. *Ed. note*). Is wheat growing really the first on the list in the agricultural production of the United States? No, certainly not, SANDERS states, not even se-

cond or third. Next to the automobile industry in the productive activities of the country stands the wholesale meat packing, with an annual output valued in 1929 at 3,394,673,000 dollars. "We certainly ought to produce enough wheat to make our own bread" the writer continues. "Competing however in the world's markets with Canada, Soviet Russia and Argentina, does not impress me as particularly sound procedure. Many farmers in the North-west, as well as many in Nebraska and Minnesota have been checking out of this wheat game and that to their own great advantage. But there is still room either for revision downward in the seeding or for introduction of good live-stock into these wheat belts". The writer disputes any future opportunity of producing 700-pound milk fed calves. He asks: "May there not be a happy medium between the two extremes of producing ultra baby beef and 1700 pounds cattle?" He admits however, that in preferring cattle up to 1400 pounds in weight, he is at present in a minority as far as the general public is concerned.

DECREASE OF HERD BOOK MOVEMENT IN THE UNITED STATES. — Charles S. PLUMB, who has collected at the library of the Ohio State University nearly 4500 entirely distinct and separate volumes of stud-, herd- and flockbooks, shows in an article published in the *Breeder's Gazette* (Chicago, May 1931) that there is no swine herdbook published now in the United States, most of the sheep flock books associations have ceased publishing their records and the publication of stud and cattle herdbooks shows too a remarkable decline. What is the reason for this decline? He states that most of the members of breed societies are not seriously interested in the study of bloodlines and really have no use for the herdbook. But, should not the breed association engage in some form of systematic effort by which the breeder may be impressed with the necessity of the study of bloodlines and find a use for the herd book rather than cast them aside? One may surmise that lessons might be worked out from these books in elementary form, whereby the breeder interested in breed study would derive benefit.

The cost of publication of such volumes should not be a serious hindrance. The writer is of the opinion that some of the money now spent on prize awards at shows might be economised. In fact almost 16 % of the total income of a number of important American Breeders Association is devoted to breed premiums, while from his own experience as President of the American Southdown Breeders Association he shows that the present freedom in giving prize awards at shows is questionable.

THE NECESSITY FOR AUTHORITATIVE DEFINITION OF BREED CHARACTERISTICS AND UNCHANGING CONTROL OF BREEDING POLICY IN INDIA. — The Animal Husbandry Expert of the Imperial Council of Agricultural Research, Col. A. OLVER, emphasizes in an article published in *Agriculture and Live-stock in India* (Vol. I, Part. II, January, 1931) the necessity of a systematic breeding policy in India. Before anything really effective can be achieved, however, accurate surveys of the present position, authoritative definition of the distinctive characteristics of the various breeds and some form of permanent control of breeding policy, similar to the control exercised by breed societies over breeding in other countries appear to be essential.

By these means it should be possible to ensure definition and continuity of policy and to secure the permanent interest of some of the more influential landowners in official schemes for live-stock improvement. In spite of all crossings done in the past, distinct types still predominate over certain large areas in India and it seems that at least four or five distinct basic types must have existed in India originally. Between these basic types innumerable gradations occur and to obtain true breeding strains from such heterogeneous stock must obviously entail great care in selection, and long-continued and strictly controlled breeding to a definite type. In the first place the few pure basic strains of blood which still exist ought to be defined and preserved, as there is grave danger that some will be entirely lost.

### Physiology.

RESEARCH ON THE ENDOCRINE SYSTEM OF DOMESTIC ANIMALS BY THE ABDERHALDEN METHOD OF ENZYME INTERFERENCE. — A series of experiments have been carried out by KRONACHER and HOGREVE to determine the normal action of the endocrine system in domestic animals with special consideration of the possibilities of applying the results in animal husbandry and of the very limited possibilities of experimenting with valuable stock animals. The transformation of the secretions in the ABDERHALDEN reaction and its determination by the interference method of HIRSCH (modified to allow of experimentation in series) are described. Certain questions of technique are cleared up by

preliminary experiments and certain new fundamental principles on the conversion of genital glands described.

The principal results of the experiments on about 100 cattle of both sexes and different ages are the following :—

(1) The correlation between the enzymes of certain of the endocrine glands (hypophysis, thyroid, thymus, genital gland, suprarenal capsule) has been confirmed by experiments on cattle, which have made it possible to establish provisionally the normal values.

(2) The specific sexual characters of cattle are less pronounced than in man. Reciprocal interaction between the organism of the mother and of the embryo is well marked.

(3) The decomposition of the mammary glands is closely related with the lactation period, as has been determined at different periods of gestation and on young animals.

(4) The decomposition curves of all glands, as also the fundamental concentration of the serum measured by the interference method, are characteristic of the age and development of the animal.

On the basis of the standard values of secretion established it would seem practicable to study the correlation between the endocrine functions and production from the stockfarmer's standpoint. (*Communication from the authors to the International Institute of Agriculture*).

### Alimentation.

ESTIMATION OF THE STARCH EQUIVALENT OF MAIZE ENSILAGE. — FINGERLING and his collaborators, working at the Agricultural Experiment Station of Leipzig-Möckern, find from respiration tests that good maize ensilage with a dry matter content of 22.03 % has a starch equivalent of 13.6 kg per 100 kg. (*Die landwirtschaftlichen Versuchs-Stationen*, Berlin 1931, Band 112, Heft 5-6, p. 243).

### Cattle.

MILK PRODUCTION IN SWITZERLAND IN 1930. — Results of periodical determinations of the milk production of the different Swiss breeds are given in a report of the Sub-Commission for Statistics of the Milk Commission of Switzerland. (*Landw. Jahrbuch der Schweiz*, Bern 1931, Heft 3, p. 382-420).

Breed	Number of cows tested	Mean annual milk yield in kg	Mean fat content
Red spotted Simmental cattle . . . . .	1 650	4 575	3.90 %
Black spotted Fribourg cattle . . . . .	185	4 789	3.89
Brown cattle . . . . .	2 000	4 291	3.90
Eringer cattle . . . . .	233	2 332	—

The figures undoubtedly represent exceptional yields for all breeds because as a rule it is only the best herds that are tested. The average quantity of milk produced by Swiss cows in 1930 was 3000 kg. The total milk production, slightly diminished on account of the drop from 870,000 to 845,000 cows, was 26,247,000 quintals; of which 37 % was utilised on the farm for consumption and as feed, 63 % was marketed as fresh milk or for conversion into other products (9,489,000 quintals). The total milk production has decreased during the last 5 years. The quantity converted to other products has considerably fallen off while that consumed on the farm has increased, as will be seen from the following figures (in thousands of quintals) :—

Year	Total production	Milk used as feed on the farm	Milk con- sumed on the farm	Milk mar- keted for con- sumption	Milk con- verted into other products	Exported surplus
1926 . . . . .	27 515	4 800	4 000	7 000	11 683	82
1927 . . . . .	26 980	4 800	4 000	7 000	11 053	127
1928 . . . . .	28 080	4 900	4 000	7 000	12 189	9
1929 . . . . .	26 880	5 300	4 200	7 000	10 418	38
1930 . . . . .	26 110	5 500	4 200	7 000	9 489	79

The increased use of milk on the farm (about 15 % as feed and 5 % for consumption) is noteworthy; the reduction in industrial use between 1926 and 1930 is about 20 %.

## Sheep.

CONTRIBUTION TO THE STUDY OF THE PROCESS OF LENGTHENING OF THE WOOL STAPLE BY MICRO-CINEMATOGRAPHY. — C. KRONACHER and G. LODEMANN in continuance of their earlier work have studied by means of the microscopic and cinematographic photographs the changes produced in a wool fibre when stretched. The three well known phases of lengthening are clearly apparent. They are however not produced by the three different layers of the hair, since the cuticle, the cortex and finally the medulla all undergo typical lengthening. Lengthening is most readily observed by watching the displacement of the edges of the cuticular scales. The free ends draw apart at first slowly, then quickly and then again slowly. Previously invisible crevices may become more apparent. The point of rupture does not as a rule coincide with a division between cells but cuts through a cell, showing the close connexion between the cuticle and the cortex. The modifications of the cortex are not easily understood. The fibrous structure is clearly apparent. The rupture takes place across cells in the cortex also. Usually disintegration of the cellular system does not separate it into fibres. The air-containing medulla seems to follow the lengthening of the other layers without resistance.

These workers in partial agreement with SPEAKMAN find the explanation of the three phases of lengthening in the construction of the hair cells and their arrangement. The cells, which are firmly united, are composed of a cell membrane surrounded by a viscous intermediary substance. During the first phase the interior friction of the substance of the hair prevents any distortion of structure. The second phase is produced by the flowing of the viscous mass and a straightening of the fibres. The third phase is limited by the extensibility of the membrane. Then comes the rupture. On account of its thickness the cortex is of fundamental importance in the process of extension. But the state of the cells composing it and the colloidal state of the viscous substance depend largely on the protection given by the cuticle. Thus it is essential in examining wool to attribute considerable importance to the cuticle being intact. (*Communication from the authors to the International Institute of Agriculture*).

## Pigs.

PLANT PROTEINS AS A SUBSTITUTE FOR ANIMAL PROTEINS IN FATTENING PIGS. — At the Experiment Station of Ruhlsdorf, Germany, feeding trials have been carried out by W. STAHL, A. GÖHNER and F. BARTH in view of the considerable differences in price of the various protein feeds and of the fall in prices of porkflesh. The experiments aimed at determining up to what point plant protein, which is at present less dear, can be substituted for animal protein, and how the various forms of animal protein compare as regards costs and results in fattening on a basic ration of potatoes. The results obtained up to the present are as follow:—

I. In forced feeding of pigs up to a weight of 50 kg the protein-ration may be composed half of plant (groundnut meal, sunflower cake meal) and half of animal proteins. At least 100 gm of fishmeal must however be fed. If the weight exceeds 50 kg the amount of fishmeal may be reduced to a minimum of 50 gm.

The exclusive use of oilcakes involves a reduced food consumption, a prolonged fattening period, waste of feed and increased costs.

II. As regards animal protein feeds the following were tested:— (1) meat meal, (2) herring meal, (3) whale meal, (4) tankage, (5) 'Victoria-Schlachthof' composed of meat meal and tankage, (6) 'Victoria', composed of tankage and fishmeal, (7) 'Ruhlsdorf protein mixture', composed of 40 % herring meal 20 % meat meal, 20 % blood meal, 20 % dried yeast. The experimental results are given in the following table:—

Protein	Number of days of fattening	Initial weight kg	Final weight kg	Daily gain gm	Supplementary feed kg	Potatoes kg
Meat meal . . . . .	140	31.14	104.36	523	1.0	5.71
Herring meal . . . . .	119	29.96	101.36	600	1.0	5.85
Wale meal . . . . .	140	29.50	99.98	503	1.0	4.42
Tankage . . . . .	119	30.35	102.84	605	1.0	6.08
Victoria-Schlachthof . . . . .	140	26.50	100.67	530	1.0	5.35
Victoria . . . . .	133	28.71	99.01	528	1.0	5.62
Ruhlsdorf protein mixture . . . . .	133	30.00	105.93	571	1.0	6.26

The supplementary feed consisted of 700 gm of a mixture composed of 34 % of barley, 34 % of rye and 2 % of chalk and 300 gm of the protein under trial. Unlimited potatoes were fed.

It is concluded that except in the case of whale meal each of the protein feeds tested can alone produce results as good as those obtained with a ration of mixed proteins. The figures for the daily gain however do not allow of judging between the values of the various feeds because the differences are due to the inevitable experimental inaccuracies and to the individual development of the animal. (*Zeitschrift für Schweinezucht*, 1931, Nr. 31 und 34).

## Poultry.

OFFICIAL REGISTER OF LAYING TRIALS RECORDS OF THE NATIONAL POULTRY COUNCIL OF GREAT BRITAIN. — The *Register of Laying Trials*, the 5th volume of which has just been issued (from Sentinel House, Southampton Row, London), is one of the many activities of the National Poultry Council. The objects of this Council are to protect and further the interests of all concerned in the poultry industry, to promote the provision of greater facilities for higher training in the subject at public institutions, to conduct investigational work of a scientific and practical nature, to influence and co-operate with central and local authorities in extension of poultry breeding and egg production, etc. The Council has for many years been occupied with the problem of making the records obtained in laying trials more generally useful to poultry breeders and others. In 1923 a Conference was called which agreed upon a uniform basis of grading eggs for test purposes, which has been adopted in all subsequent tests. The *Official Annual Register of Laying Trials Records* is restricted to entries in recognised tests and to birds which attain the following minimum standards of production:— (a) for White Leghorns, White Wyandottes, Black Leghorns, Rhode Island Reds, Buff Rocks and Anconas, 200 first grade eggs; (b) for other breeds, 180 first grade eggs; (c) for ducks of all breeds, 230 first grade eggs.

The scheme of egg grading adopted in the pullet tests is:—

Period of Trials	Minimum weights	
	First grade	Second grade
	Ozs	Ozs
First 4 weeks . . . . .	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
5th to 8th week (inclusive) . . . . .	1 <sup>11</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>
9th week to end of trials . . . . .	2	1 <sup>7</sup> / <sub>8</sub>

A. M. F.

## Fur Farming.

PROTECTION OF CHINCHILLA BREEDING IN CHILI. — The Government of Chili has decided to establish chinchilla farms in the provinces of Antofagasta, Atacama and Coquimbo, owing to the feared extinction of the animal. An experimental farm is to be started near the town of La Serena. Prizes of up to 100 pesos for each chinchilla domesticated will be awarded to private breeders. The existing farms will be officially registered and controlled. Chinchilla hunting and trading are forbidden for a period of 5 years. Sale will be allowed only of animals for stocking licensed farms. To these farms also will be reserved the privilege of catching chinchillas, the number of animals and the hunting region being strictly defined. Dogs, gas nor any other means which might kill the animals may be employed in their capture. The chinchilla farms will be obliged to retain 10 to 50 % of their stock for breeding purposes during the 5 years in which hunting is forbidden. The exact percentage will be fixed by the 'Ministerio de Fomento'. Private farms will be inspected each year, the skins produced will be stamped and sealed. It will be forbidden to visit the farms, special permits being reserved for the Ministry mentioned.

E. M.

## AGRICULTURAL INDUSTRIES

### Miscellanea.

#### INDUSTRIES OF PLANT PRODUCTS.

**INFLUENCE OF THE SIZE OF STARCH GRAINS ON YIELD OF ALCOHOL.** — As a result of an interesting study of this question E. SZEGO states that the small starch grains in the best potato flours show by absorption of water a greater viscosity than the large grains and by their nature give a higher yield than that of the large grains; the lower value of the small starch grains in the second quality products and by-products is a result of the longer process of manufacture. The starch industry needs to develop a method by which the small grains may be extracted as rapidly as possible, so as to prevent their modification. (*Annales de la Brasserie et de la Distillerie*, 1931, No. 25).

**SOME FACTORS AFFECTING THE STORAGE CAPACITY OF SUGAR.** — In a study of the hygroscopicity of sugar G. MEZZADROLI, A. AMATI and C. BOLZANO investigated the absorption of atmospheric moisture, the formation of inverted sugar, the ash content, the electric conductivity of saturated solutions and the relation between the conductivity and the ash content and pH of the sugar solution.

The hygroscopic character of a sugar is not due to mineral impurities but to the presence of colloidal organic substances in the crystals produced from a badly purified syrup; while mineral impurities, particularly traces of electrolytes such as lime, magnesium, etc. originating from the beet, act as catalysts. A partial hydrolysis results, with the formation of inverted sugars and organic acids by their oxidation. All these products are more hygroscopic than the initial sugar. Amongst the colloidal organic substances the most important is peptine, for it increases the viscosity of the syrup and prevents the complete separation of the mother liquor and sugar crystals in the centrifuge. (*Industria Saccarifera Italiana*, 1931, t. 24, n. 4, p. 154-161).

**' DRY ICE ' AS INSECTICIDE.** — It is known that ethylene oxide ( $C_2H_4O$ ) is highly toxic to insects and is harmless to grain, leaving neither flavour or odour, but its use is difficult owing to its rapid vaporisation and inflammability. By mixing solid carbon-dioxide with ethylene the vaporisation can be regulated and the danger of fire eliminated, and as it also increases the respiration of insects it facilitates their poisoning by increasing the absorption of  $C_2H_4O$  vapour.

The efficacy of the treatment has been shown by tests in closed silos (steel and concrete) and open silos, in which insects in the grain were completely killed. (*Industria Italiana del Freddo*, 1931, No. 12).

**PROCESS FOR RAPID FREEZING OF FRUITS.** — A large rapid freezing plant for fruit was built by HOUSTON in the State of Georgia and gave such good results that another was constructed in Florida. The main fruit refrigerated is a delicate peach which is gathered when practically ripe. The fruits pass through tunnels in which the temperature is  $35^{\circ}C$  below zero. The cells remain intact and the fruit keeps in perfect condition without the formation of crystals in the tissues. (*Boletín de la Sociedad Nacional de Agricultura*, Santiago de Chile, 1931, Núm. 6).

**A NEW ENZYMATIC PROCESS FOR THE CLARIFICATION OF FRUIT JUICES.** — Experiments carried out at the Geneva Experimental Station, New York, were successful in clarifying the most various and difficult fruit juices by means of cultures of a proteolytic enzyme capable of separating the pectine without in any way altering the characteristic flavour and constituents of the juices. After precipitation of the colloids the clear juice is run off and pasteurised, or else a substance such as 1 per 1000 benzoate of sodium is added to prevent further action of the enzyme. (*Communication from the Agricultural Station, Geneva, N. Y.*).

**LOW TEMPERATURE CONCENTRATION OF PLANT AND ANIMAL LIQUIDS.** — Concentration at low temperature, that is at temperatures below  $40^{\circ}C$ , has of recent years assumed considerable importance as forming the basis of the food preserving industry which has developed with great rapidity in all countries.

The best method of preserving the vast quantities of readily decomposing liquids produced by animals and plants which are essential or useful human foods, is by con-

centrating them into small volume without altering their chemical and biological properties and vitamins. This is possible only with concentration at low temperature or by using special systems of refrigeration.

The conditions of production at certain seasons and the difficulties of supplying the large consuming centres often result in large quantities of products being used when they have lost their best natural qualities and are no longer suitable foods. The importance of various categories of food products consists in fact, not only in their calorific value, but in their properties of stimulating the activity and growth of living cells, of facilitating the processes of assimilation, of synthesis, etc., and transmitting as much as possible of the original source of organic life, that is, sunlight.

Freezing, which is of great use in the preserving of highly valuable foods such as meat, is not widely applied for concentrating liquid foods on account of its cost and the need for expensive plant, which can be supported only where large quantities of liquids are available for treatment. Freezing cannot moreover produce high concentrations, for the following reasons:—

(1) because the freezing point of the liquid becomes lower as the solution becomes more concentrated;

(2) because the separation of the ice from the concentrated solution is difficult;

(3) because concentrated solutions of plant and animal products are generally hygroscopic and insufficiently dense for preservation.

Low temperature concentration on the other hand allows of concentrating the various liquids to any density, economically and by means of small plant.

Concentration at low temperature may be obtained by applying the law of partial pressures or by means of vacuum apparatus. An ingenious application of Dalton's law is used in the various types of plant in which the liquid to be concentrated is brought into contact in a fine spray with warm dry air. In these conditions a high rate of vaporisation is obtained even at a low temperature and the liquid is heated for only a very short period. Contrary to what might be expected this system has not come into wide use, for simple as it is in theory, its practice presents a number of difficulties.

The solution of the problem of the low temperature concentration of plant and animal liquids depends thus on the possibilities of suitable vacuum plant. To realize the conditions in which concentration *in vacuo* at low temperatures takes place the following table should be studied, which shows the water vapour tension at temperatures below 40°C and the volume in cubic metres occupied by 1 kg. of saturated vapour.

Temperature . . . . .	100	40	37	33.5	20.4	24.5	18
Tension in mm. . . . .	760	52	45.6	38	30.4	22.8	15.2
Volume occupied by vapour . . . . .	2.36	20.8	24.10	28	35.4	45.0	68.28

The numerous types of plant invented for this purpose may be classified in two sections: those with variable pressure and those with constant pressure, or, which comes to the same thing, those with variable and constant temperature.

*Variable pressure concentrators.* — The many types of variable pressure installation are made up of a heating apparatus (which may form part of the expansion chamber), an expansion chamber and a condenser, connected by tubing. The simplest type of this is the ball apparatus, formed of a double bottomed hemispherical water heater closed by a sphero-conical cap connected to the condenser by piping. With all these forms of apparatus there is a maximum temperature in the double bottom, minimum in the condenser and medium in the expansion chamber, and consequently a different pressure in each of the three parts. The density of the liquid to be concentrated in the spherical cap diminishes gradually from the centre to the periphery. The liquid thus has different boiling points corresponding to the part of the heating surface with which it is in contact and the pressure at that point.

Violent boiling and phenomena of super-heating ensue, which make this type of apparatus unsuitable for low temperature concentration, since the temperature of the water in the double bottom may not be appreciably higher than the temperature of concentration if the liquid overflowing the apparatus is to be avoided. In these conditions the quantity of heat given out in unit time is minimum, and consequently the rate of vaporisation is also minimum. To make the density of the liquid to be concentrated uniform and to increase the heating surface in order to raise the vaporisation rate, the hemispherical cap is replaced by a bundle of tubes heated on the outside; but

even with this improvement the boiling point in different parts of the tubes remains different, decreasing slightly from below upwards as the pressure falls.

In low temperature concentration therefore, the liquid to be concentrated must be in a very thin layer, so as not to allow any appreciable difference in pressure between the heated surface and the evaporating surface. In the variable pressure apparatus the vaporisation rate depends also on the amount of heat that can be absorbed by the liquid in unit time and on the rate at which the vapour formed passes to the condenser. This rate is a function of the difference of pressure existing between the two parts of the apparatus and of the resistance the vapour must overcome to pass from one to the other. If, for example, in the condenser there is a temperature of  $18^{\circ}\text{C}$  the pressure will be 15.2 mm. of mercury, and if the temperature of concentration is  $40^{\circ}\text{C}$ , corresponding to a pressure of 52 mm., there will be a difference in pressure of 36.8 mm., to which will correspond a rate of vaporisation proportionate to the resistance the vapour must overcome in passing into the condenser. At a lower temperature of concentration, for example  $29.4^{\circ}\text{C}$ ., with a corresponding pressure of 30.4 mm., the temperature in the condenser being constant at  $18^{\circ}\text{C}$ , there will be a difference in pressure of 15.2 mm., but the volume of vapour which must pass will be increased (as in the case of concentration at  $40^{\circ}\text{C}$ ) from 20 cu. m. per kg. of water evaporated to 35.4 cu. m.; consequently the vaporisation rate will not be reduced, on account not only of the diminished difference in pressure but also because of the increased friction due to the greater volume of vapour passing into the condenser. The lower the temperature of concentration the worse will be the conditions, so that it must be concluded that the variable pressure apparatus is not adapted for low temperature concentration.

*Constant pressure concentrators.* — The apparatus for concentration at low temperature (below  $40^{\circ}\text{C}$ ) has up to the present received little attention because the preserving industry has been more concerned to obtain economical concentration than concentration at a low temperature. As required by the industries concentrating most organic liquids the types of apparatus for concentrating or distilling at variable pressure have received much study, and there is little hope with this system, of obtaining low temperature concentration without a considerable reduction in the vaporisation rate, nor of distilling liquids which do not readily vaporise. An attempt should however be made to determine whether among the phenomena produced during evaporation of the solution there is not one which might serve as a basis for the construction of a new type of apparatus.

It is known (Watt's law) that when in a gas-free environment there are present a hot liquid and a cold surface capable of absorbing its heat, a pressure is produced corresponding to the vapour tension of the liquid condensed on the cold surface; consequently the lower the temperature of the cold surface the lower is the pressure produced in the vessel.

It is also known that at constant pressure the time taken by the vapour to pass to the condenser is proportional to the square of the distance travelled. If therefore a vaporiser and a condenser are placed close together in a vacuum chamber a pressure will be obtained corresponding to the vapour tension of the liquid condensed on the condenser, and the vapour will pass to the condenser at a quicker rate the closer the two parts of the apparatus are together, that is to say, the less the friction to be overcome. In these conditions the temperature of concentration is that of the condenser and the rate of vaporisation depends on the quantity of heat which reaches the vaporiser.

In theory therefore the problem of industrial concentration and low temperature distillation is easily solved. The practical application requires the apparatus represented theoretically in the accompanying diagram (fig. 1).

In a closed cylinder evacuated by a vacuum pump are placed side by side a vaporiser (2) and a condenser (3). The vaporiser (2) is formed of spirally coiled tubes having on the side away from the condenser by which the vapour formed within can escape without appreciable friction. Within these tubes are other tubes (5) through which passes, in the opposite direction to the liquid to be concentrated, water or steam at a high temperature. The liquid to be concentrated circulates in the tubes forming the vaporiser and is heated by means of the inner tubes (5). The rate of flow can be regulated to allow the liquid to reach the required degree of concentration by the time it has passed through the whole vaporiser.

By Watt's law the pressure within this apparatus is equal to the vapour tension of the liquid condensed on the condenser; thus the temperature of the liquid to be concentrated or distilled which is circulating in the vaporiser will be close to that of the condenser.



This very simple device makes it possible to obtain with ease very low temperatures of concentration by keeping the temperature of the condenser low, and thus also to economise in the water required for cooling. At about 100°C the consumption of water is reduced to about 7 litres per kg. of vapour.

Moreover, in concentration of solutions at temperatures above 40°C the water issuing from the condenser, with a temperature approximately equal to that of the solution, may be utilised for heating a second apparatus. Solutions may thus be concentrated even at low temperatures with considerable economy of water and fuel.

As the vapour passes from the vaporiser to the condenser without appreciable friction the rate of vaporisation may be very great. It is limited in practice however by the possibility of constructing a vaporiser capable of retaining the violently boiling liquid without producing resistance to the passage of the vapour to the condenser.

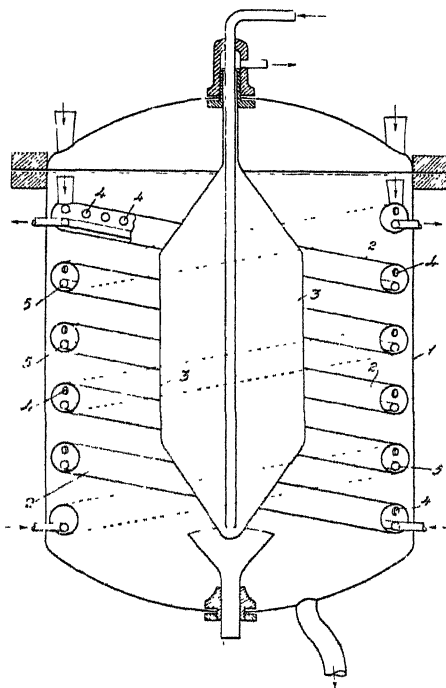


FIG. 1. --- Diagram of the ANGELUCCI constant pressure concentrator.

With the vaporiser of the apparatus in question can be obtained vaporisation rates of about 100 kg. per hour per square metre of heating surface at temperatures of about 40°C. If the temperature of concentration is lowered the vaporisation rate must also be reduced, because boiling is extremely violent.

The liquid circulating in the tubes of the vaporiser in a quantity proportional to the vaporising power of each tube and to the concentration desired, is gradually concentrated and consequently its boiling point gradually rises. To obtain a uniform rate of vaporisation at all points it is necessary to raise the temperature as the boiling point rises. This is automatically regulated if the dimensions of the tubes (5) and the initial temperature of the heating medium have been rightly calculated.

There exists, particularly in concentration at low temperatures, an appreciable difference in temperature between the heating medium and the liquid to be concentrated; there thus forms a layer of vapour round the heating tubes (5) which prevents the liquid from coming in contact with them. This vapour evidently has a temperature higher than that of the liquid and passes into the condenser at the temperature at which it

is produced so that it does not expand, and consequently destroys any scum which might be formed during concentration.

On these principles a very simple apparatus for low temperature concentration (20-40°C) has been invented and patented by Dr. ANGELUCCI of Rome. The apparatus may also serve for distillation or recuperation. It has been found superior to the concentrators in use, and with slight modification it can be adapted for the concentration of plant and animal liquids, specially those which readily undergo alteration, such as milk, eggs, fruit juices, etc. It is hoped that the application of these principles to concentrators will make it possible to obtain products retaining all the physico-chemical and bio-chemical properties of the fresh foods. The trials which have so far been carried out with the apparatus (which will be reported later) indicate that it is the constant pressure concentrator which will come into general use in agricultural industry.

G. STAMPA.

UTILISATION OF TOMATO RESIDUES. — A valuable food is obtained by desiccation of tomato residues. As much as possible of the water is first removed by pressure. Hot gases are then passed through at 120°, or at 200° if the residues have not been pressed. The dried residue is then ground and an orange, bitter-tasting product is obtained, at a rate of about 7 kg. per ton of tomatoes.

Oil may be extracted from the seeds after separation from the pulp. The oil has the following composition:— olein 45 %, linolein 34 %, palmitine 12 % and stearin 5.9 %.

By pressure 17 % of the oil is obtained, or 20 % by extraction. (STEWART, *Food Industry*, 1931, No. 3, pp. 112-114).

LEMON SEED OIL. — Dr. A. ROMEO has repeated the studies of P. BERTOLO, who obtained from lemon seeds by means of solvents 30 to 35 % of a clear, yellow oil, slightly bitter, with a pleasant odour, semi-seccative (density at 15° = 0.9230, degree of seccativity = 5.10 %) and by colour reactions (SbCl<sub>3</sub> in chloroform) has found that the oil is rich in vitamin A. (*Industria chimica*, Rome, 1931, No. 12).

NEW RESEARCH ON VITAMIN C — A Swedish scientist, O. RYGH, has presented to the 'Académie des Sciences' at Oslo the results of a study carried out in collaboration with his wife and PER LALAND. They succeeded in preparing the preliminary stage of vitamin C, which is identical with the substance known as narcotine. Narcotine is found in relative abundance in young plants and unripe fruits; it disappears during maturation with formation of the vitamin. O. RYGH and his co-workers obtained the transformation of narcotine in the laboratory by means of methyl groups. The active vitamin C may be prepared from narcotine either by purely chemical means or by adding certain enzymes. Ultraviolet rays seem also, but very feebly, to activate narcotine. The experiments were carried out partly at Oslo and partly at Upsala.

Professor A. WINDAUS of Göttingen has also prepared pure crystalline vitamin C after 4 years of work. (*Zeitschrift für Fleisch- und Milchhygiene*, 1932, p. 146).

BLEACHING PLANT FIBRES. — *Cotton*. Experiments show that in general the two most important factors are the reaction of the bath and its stabilisation. The maximum rate of decomposition is obtained with alkaline solutions of H<sub>2</sub>O<sub>2</sub> with a pH exceeding 13.

Stabilisation of caustic solutions is at present obtained by means of sodium silicate; bleaching of cotton in a silicate containing medium, besides being more efficacious than an alkaline medium at the same concentration of H<sub>2</sub>O<sub>2</sub>, reduces the consumption of O<sub>2</sub> and eliminates the necessity of boiling. Bleaching with peroxide of hydrogen is economical and gives a fibre which keeps its colour, is strong, elastic and spins and dyes well. It is thus better than chlorine bleaching.

*Flax*. — The slow and unreliable process of bleaching in the field has been successfully replaced by bleaching with combined H<sub>2</sub>O<sub>2</sub> and chlorine. Peroxide bleaching gives good results with several plant fibres and with animal fibres which are highly resistant to bleaching (tussore silk). The ever-increasing consumption of H<sub>2</sub>O<sub>2</sub> in the textile industry shows its utility. (*L'Avenir textile*, Paris, 1931, No. 11).

#### INDUSTRIES OF ANIMAL PRODUCTS.

PHYSICAL STATE OF PHOSPHATES IN MILK. — By simple physical methods such as centrifuging, freezing and dialysis the tricalcium phosphate particles in milk can be considerably broken down. The present conception of casein by which the lime is

combined with a phosphoric hydroxyl group, becomes thus less certain. All the colloidal lime of milk would appear to be in the form of tricalcium phosphate. (*Comptes rendus de l'Académie des Sciences*, 1931, No. 21).

#### FAIRS, CONGRESSES, etc.

THIRTIETH INTERNATIONAL FAIR AT MILAN, ITALY, SPRING 1932. — The amount of support already received seems to guarantee the success of the fair.

Amongst the most interesting exhibits will be that on *Foodstuffs* and that on *Chemistry*. The latter will take the form of a world review of manufactured products, particularly those concerned with agriculture and the industries connected with plant and animal produce.

Amongst the Congresses to be held during the Fair will be one on the *Dairy Industries*, which is expected to be of great interest in view of the important questions to be dealt with and the agreements which may be reached.

E. G. & G. S.

### BOOK REVIEWS \*

#### Meteorology.

*Meteorologisches Taschenbuch*, herausgegeben von F. LINKE. Akademische Verlagsgesellschaft, Leipzig, 1931, in-8, XI + 316 p., illustr.

[This useful book should serve as a *vade-mecum* for all concerned with meteorology, geophysics and kindred sciences. Five other experts have collaborated with Dr. LINKE in its preparation. The matter is divided into 9 chapters: — (1) History of meteorology with chronological tables giving details of the invention of various instruments and of the principal stages in the development of meteorological theory. (2) List of the meteorological services throughout the world, with the names of the Directors. (3) List of the more important periodicals dealing with meteorology and geophysics. (4) List of the stations transmitting radiotelegraphic messages, with their call signals and wavelengths. (5) International codes in use. (6) Summary of the static, dynamic and thermodynamic equations. (7) Description of meteorological instruments and methods of observation (The main bulk of the book). (8) Climatological data. Tables are given showing for each of the 262 stations in the world the latitude, longitude, altitude, monthly and annual averages of pressure, temperature and rainfall. (9) Tables giving most of the numerical data necessary for meteorologists and geophysicists].

#### Seeds and Germination.

LEHMANN E. & AICHELE F., *Keimungsphysiologie der Gräser* (Gramineen), XXIII + 701 p., illustr. Stuttgart 1931, Ferdinand Enke.

[Germination problems are often of great importance to the farmer. But the literature of the seed and germination is so vast that even specialists cannot know the whole, and this treatise on the Physiology of Germination in the Gramineae is therefore particularly welcome.

The subjects treated are:— the Gramineous plant, its fruit and seed during development, the resting period and germination; morphology; chemical composition; changes in form and composition; adaptation to environment; viability in various conditions; respiration of seeds during the resting period; methods used in germination tests; influence of water, temperature, light and chemical substances on germination; respiration during germination.

The whole is treated from a practical as well as a theoretical standpoint.

There is no summary of present knowledge of germination, but references are given to the literature of the subject].

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\* Under this heading are included short synopses of books sent for review.

### Fruit Production.

FEDERER Kurt, *Obsterzeugung, Handel- und Verwertung in der Tschechoslowakischen Republik*, 1931, Rolandverlag Morawitz, Prag VII, 320 p.

[The writer has made a thorough study of fruit production, marketing and utilisation in Czechoslovakia, making use of scattered documentation and all accessible statistics, as well as detailed investigations made on the spot and with the help of widespread distribution of circulars.

There is a historical introduction followed by statistics of fruit production. The chief interest of the book is contained in a chapter giving statistics and technical information on the marketing and utilisation of fruit, dealing in detail with questions of standardisation and cooperative marketing and proposing improvements in this direction which should lead to the formation of a central buying and selling organisation covering the whole country and including the whole production and commerce of fruit, wine production, nursery plantations, the production and commerce of vegetables and all horticultural produce. The final chapter deals with the consumption and industrial utilisation of fruit, particularly in alcohol distillation and the manufacture of liqueurs and fruit wines].

POWELL, H. C., *The Culture of the Orange and Allied Fruits*, 355 pp., 83 figs. Central News Agency, Ltd., South Africa, 1930. Price: 1 guinea

[Prof. Clark POWELL, of the University of Pretoria, is fully qualified to compile an authoritative textbook on citrus culture. Although the book is written primarily for South African growers many of the principles apply equally well to other countries and are based mainly on experimental work carried out in California and other American countries.

The chapter headings will indicate the scope of the work:— the origin, spread and commercial significance of citrus species; citrus varieties; the citrus nursery; establishment of a citrus grove; bud selection and tree records; citrus root stocks; fertilisers and manures; cultural operations (irrigation, cultivation, alkali, pruning, top-working); judging citrus fruits; picking and packing citrus fruits; marketing and organisation; common citrus diseases and pests and their control; citrus growing in the West Indies and British Honduras; the citrus industry of Palestine and Cyprus; the citrus industry of Florida; the citrus industry of California.

In the chapter on the business side of the industry the author emphasises the importance of organisation as the key to success in marketing. The success of the industry in each citrus growing country must depend on supplying fruit to each market strictly in accordance with the capacity of that market. The profound influence that cooperative action and co-ordinated control can exercise on the fortunes of an industry is well illustrated in the chapter on the history and development of the citrus industry in California].

### Livestock.

CARDAS A., *Cunostinti de zootehnie generală*, 241 p., 133 fig. Iași 1931, Goldner éd.

[This work by the well-known Professor of Zootechnical Science at the University of Jassy gives a brief but complete survey of the present state of the general science of animal husbandry. The livestock problems of Rumania are discussed with special reference to the introduction of improved foreign stock. The results of previous introductions are discussed in detail. Other chapters deal with recent advances in genetics and their application in breeding practice, with selection and measures for promoting stock farming].

THOMAS, J. F. H. *Sheep Folding Practice*, London, Vinton & Co. Ltd. 1931. 108 pp.

[In the present conception folding usually implies the daily confinement of the flock on an area of food crop defined by the use of a suitable form of portable fencing. This interesting system of management of sheep on arable land, which is a common practice in Great Britain, is exhaustively treated in the book. After having dealt with the evolution and application of folding practice, the influence of folding on soils and stock is analysed. The book covers a wider field than the title suggests. Besides materials and equipment for folding, crops and rotations, breeding and nutrition, shepherding, breeds and crosses and the productivity of flocks are discussed].

GRASSER, Georg, *Chemie und chemische Technologie tierischer Stoffe. Eine Einführung in die angewandte Zoochemie*, 272 p, Stuttgart 1931, F. Encke, geheftet 16, gebunden 17 60 R. M.

[The author, who is Head of the Institute of the Zootechnical Division of the Imperial Japanese University of Sapporo, undertakes the collection of material for a new branch of university teaching, Zoochemistry. The subject embraces the chemistry of animal substances and animal products and their industrial treatment. It is thus a part of biochemistry, occupied only with substances of animal origin, without entering into details of their genesis.

The matter is arranged as follows :— A short introduction describes the systems of organs (integuments, muscular and skeletal tissues, fatty tissues, secretory organs and sexual organs, circulatory and nervous systems), then deals with the chemistry of proteins and the distribution of chemical bodies in the animal organism. The special part deals systematically with the different animal substances, their general properties, physical and chemical, and their industrial treatment. There is thus information about the substances of the body envelope (skin, hair and wool) and their utilisation (tanning, the fur trade), about the substances of the skeletal tissue (bone, ivory, stags' horn), of muscular and fatty tissue, about waxes and the industries concerned in their elaboration and preserving.

Other chapters deal with glandular secretions, non-secretory substances (hormones, eggs, enzymes, silk, milk, honey, etc.), substances of the circulatory system (blood), waste products of digestion (urine, excreta) and fossil animal substances (bitumens, guanos, fossil farina).

The work thus studies questions which greatly concern the modern breeder. In the part dealing with the industrial utilisation of animal products there is much of general interest to the stock-breeder and much that he will find provocative].

## FORESTRY

### Recent Research on the Influence of Forests in Checking Erosion and Surface Run-off.

The occurrence in recent years of most disastrous floods in widely distant parts of the world has greatly impressed public opinion and the World Press has devoted much attention to the matter, it being generally believed that the main cause of these catastrophes is to be found in deforestation. The responsible authorities have been severely criticised and charges made, alleging culpable weakness and negligence in regard to the proper preservation of the forests in the catchment areas of the rivers.

Scientific journals have likewise supplied information as to the various unfavourable conditions, which taken as a whole, have affected prejudicially the situation in particular cases even where the watersheds have been relatively well afforested. Thus the beneficial influence of afforestation in checking erosion and surface run-off has been once again emphasised, though with the object of discouraging any hazardous generalisations, expert writers have laid special stress on the necessity for establishing the maximum limits of such influence. In justice it must be confessed that the data at present available for arriving at any reasonably definite conclusions are neither numerous nor always particularly convincing. Knowledge of the general question has been considerably extended by recent experiments of a quantitative character but there is a general feeling that these experiments must be continued and their scope extended. Fortunately at the present time experimental work in the problems of forestry is being greatly developed and intensified and that even in countries in which colonization and settlement are of quite recent origin.

In certain instances the study of the different forms of influence exercised by forests has been carried out on the basis of investigations made over extensive areas, the object for a long period of observation in afforested conditions, which have

been unexpectedly deprived of forest growths. This Review has already published an account of the experiments carried out at Colorado (1) in these conditions. Comparative studies have also been made on a large scale between the conditions prevailing in watersheds which are afforested, covered with bushy growths or simply grassed.

The value of an extensive and prolonged study of pre-existing conditions and a corresponding study of the changed conditions subsequently brought about is fully recognised by the experts though it is felt on the other hand that the artificial element in the method vitiates the general applicability of the conclusions reached. As a matter of fact the results of a sudden and sweeping deforestation of a catchment basin, unaffected by the outbreak of forest fires, pasturing and erosion and therefore accelerated, can scarcely be compared with the cases of gradual deforestation accompanied by the vigorous play of regenerative forces which are of normal occurrence.

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Here however it is the intention to give a brief description of the experimental work that has been carried out on the subject with reference to the particular forms of influence exercised by afforestation, all of which in the long run act as a check on erosion and tend to regulate the run-off of rain waters.

*Evolution of land reliefs.* — Prof. DI TELLA (Italy), in referring to the views of the leading authorities in geodynamics and geology, sums up the general function of the forest in the constant levelling process by which land contours are affected as follows :—

“ The evolution of the mountain towards the *peneplain* corresponds to a universal law from which no land surface which has emerged is exempt. In the action of this law, the forest intervenes as an essentially climatic expression of a spontaneous biological reaction, whereby the land, through the continuity of the plant life with which it arms itself, attempts to combat the levelling tendency and is successful in retarding, if not in wholly arresting, its development during age long geological periods ”.

This biological reaction has its origin in the presence of suitable climatic conditions, the results of the simple interplay of external mechanical agencies. Henceforward progress and relapse in continuous climatic evolution alternate in the land surfaces that are the direct offspring of the bedrock and set up plant associations varying with their evolution. BRAUN-BIANQUET (France) considers that a plant association is a true biological unity and immutable, each association constituting a stage in an evolutionary series starting from the bare soil and proceeding in ascending scale. The idea of *zonal* and *climatic* soils, hitherto very generally accepted, must now be materially restricted and modified. GAUSSEN (France) is of opinion that in studying the evolutionary cycle of a land area, it should be recognised that, while paying due attention to the *geological series*, it is also important to take into account the *stages of transformation in these series themselves*. According to this authority in the course of the normal evolutionary process, in which neither human nor external agencies are concerned, the various types of climatic areas will have long been fixed. Writers on botanic geography would not however be in agreement, for the influence exercised by vegetation on a strict geographical succession in its evolutionary phases would seem insignificant if brought into relation with the whole period

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(1) DA RIOS. *Hydrology. International Review of Agriculture*. Rome, 1930, No. 8, p. 315.

of the existence of our world. MARCELIN and NEGRE (France) hold that it is also important to observe the evolutionary process as manifested in the form of the land reliefs to obtain an idea of the influence of this external transformative action in the formation of climatic zones. Purely topographical modifications in great mountain masses may be the result of some interruption or indefinite arrest in the evolutionary cycle of the area. Such modifications may be of natural origin, either direct or induced. The evolutionary stages in a strict succession brought about through a prolonged forest protection on certain soils are at times interrupted by the access of disgregated fragments, the results of some later disruption of the outcropping rocks. These fragments would have modified the soil characteristics quite differently if they had freely followed the strict cycle. Human agency in the form of deforestation and the breaking up of lands may also bring about marked topographical modifications in land reliefs. The effects of human effort in checking the evolutionary process may be considered as merely temporary when not persistently carried out over long periods in the same area but, where intense and prolonged, it may involve complete resistance to the formation of a land surface. In this case the direct influence of the bedrock is felt directly and to the full in the vegetation. The soil stratum evolved in humid granite mountain masses which have been for long ages covered with forests seems to be weak according to the writer's observations in the South of France, being as a rule 20 % and sometimes rising to 30 %. On the other hand, where the rocks break up readily there are to be found under the surface strong strata, several metres deep, producing a skeletal formation.

ERHART (France) points out that in Madagascar the process of laterisation is apparently checked by the low temperatures in the high mountains whereas in the south the scantiness of the rainfall is the chief agent in this sense. At the present time lateritic soils, even when covered with forest growth, derive no benefit from organic matter. This fact however does not signify that they were not fertile at the time of their first formation when associated with virgin forests, but the later denudation of the soil caused by forest fires has brought about such a solidification of the surface that they are now practically barren.

In harmony with the principle of the biological reaction of the earth to any rapid formation of peneplain, the present stage of investigation of the question justifies the statement that the forest, as a higher climatic expression, makes itself felt only on favourable vertical land profiles in a state of evolution and is thereafter an element serving to bring about the section formation which is best adapted for facilitating the gradual and continuous evolution of the land relief.

*Retention of water by the soil.* — It has long been observed that wooded areas have a greater capacity for retaining rainfall than open lands and in recent years observers have also taken special account of situation and of cases of rainfall accompanied by wind. HIRATA in Japan has obtained the following results:—

For every hundred units of rainfall				
land surfaces	reaching the land surface			intercepted by the crowns
	directly	indirectly through the stems	total	
<i>Plain with various forest species (Miguro Station).</i>	74.1	5	79.1	19.9
<i>On the slope and wooded, rains accompanied by wind (Motouyama Station).</i>	68	9	77	23
<i>On the slope and wooded, ordinary rains . . .</i>	71.20	7.80	79	21

Where rain is accompanied by fog, the fall on wooded areas was more abundant than on open lands. On wooded areas the maximum retention capacity was observed after long periods of drought, the reverse being as a rule the case on unwooded surfaces. These results are in agreement with those obtained in Colorado. HENRY has made tests of the retention capacity of forest litter from different species with the following results :—

Forest litter	Quantity of water absorbed		
	in relation to specific gravity	per hectare	rainfall corresponding to
Red fir	3-4 times	116 cubic metres	116 millimetres
Beech	5.88 "	55.68 "	55 "

The amount of time required for the decomposition of the litter obviously depends on the mineral basis of the soil and may also be affected by the lack of other physical elements. As however the establishment and continuance of the dominating type of vegetation is evidence that it is well suited by existing conditions, the rate of decomposition is in harmonic relation with the degree of filtration capacity, BURGER has tested percolation capacity on surfaces having different kinds of covering, tree growths, grasses, etc., making use for the purpose of a column of water under atmospheric pressure. His results are as follows :—

Column of water passing through in an hour on areas under		
Cembran pine	Red fir	Herbage only
670 mm.	295 mm.	40 mm.

The absolute percolation capacity of any given area appears to be a less decisive factor in the phenomenon of retention than such capacity in relation to the time unit, and further it should as a rule tend to diminish at the lower levels, being at the maximum and continuously effective in the strata which are nearest to the surface. It is on the degree of effective percolation capacity that the power of retention of the whole mass depends and its continuity is an important element in respect to what is known as invisible precipitation in the form of dew and adsorption. According to CHAPTAL (France) the adsorption which takes place continuously on the forest floor and in the crowns of the trees is merely a particular case of the attraction and fixation of the gases given off by the solid surfaces. The average temperature of the whole mass determines this phenomenon which is essentially connected with the surface.

It is considered that the formation in the course of soil evolution of the section profile most favourable to satisfactory percolation is a very lengthy process. Hence it is not to be expected that, after any form of disturbance, it can be fully restored within a short space of time. BURGER has observed that the best conditions for percolation are to be found where the forest growth is of long standing whereas, where artificial re-afforestation has taken place with species hastily introduced *ad hoc*, the influence of the plantations on the soil comes to be felt slowly and with well marked intermissions as compared with that exercised by natural reconstructive growths.

It also happens that quite slight and apparently harmless changes in the litter of forest land may be fraught with serious consequences. WOLSEY (United States)



noted that in forests where the surface had been burnt over, capacity to retain rain water was reduced by six-sevenths in consequence of the burning. HUFFEL (France) also observed that litter, when remaining intact on the forest floor, completely absorbed the precipitations of a continuous rain giving 61-71 mm. The experiments made at Wagon Wheel Gap, Colorado, show that the amount of water retained in the strata of the forest floor was from 30 to 40 times less when the litter was removed.

Other results of a diminution of retention capacity which are less obvious but of undoubted importance, are a reduction in microbial activity and a consequential reduction also in temperature which serves as a check upon the circulation of water. STARKEY (United States) has recently pointed out that the presence and development of the higher plant forms exercise a powerful effect upon the proportion of micro-organisms in the soil which becomes still more marked with the progress of their development. In the course of time they tend to determine a marked disproportion in the distribution of micro-organisms in the soil and become the most important factor in *seasonal microbic fluctuation* except where this fluctuation is regularly controlled by prevailing conditions of temperature and humidity. BEDFORD (Canada) recently carried out experiments to test the rate at which the decomposition of organic matter takes place by measuring the microbial activity exhibited by the bacteria found in four types of virgin soil in Alberta. These virgin soils showed an abundant microbial flora and vigorous biological activity while containing an adequate proportion of nitric nitrogen.

It is generally recognised that the presence of organic matter in solution in the water circulating in the soil may, according to the degree of concentration, give rise to important evolutionary processes in a land surface. The condition and quality of the surface covering are powerful factors in this connection. DUNNEWALD (United States) has demonstrated that in meadow lands organic matter accumulates to a degree three times in excess of that found in lands under conifers. In meadow lands the solubility of the organic matter increases with depth, a fact which may help to explain the podsolisation of the brown meadow soils which occurs on passing from the lower to higher levels. In similar environmental conditions the decomposition of organic matter is influenced by its chemical content. The work of TENNEY (United States) goes to show that organic matter with a low nitrogen content, is enriched during decomposition by crude proteins as a result of a microbial synthesis.

The facts described and their harmonious succession undoubtedly indicate that in effect any form of continuous vegetation, when once established at some given stage of the evolution of a land area, contributes to the maintenance of continued existence by assisting to set up an indefinite series of factors which combine to arrest any levelling process affecting the land profile.

*Evaporation.* — As regards the phenomenon of the evaporation of rainfall in its relation to the condition of the covering of the land surface, it should be borne in mind that this evaporation in the case of forest land takes place: (1) In the crowns of the trees so far as concerns the amount of rainfall intercepted thereby; (2) On the land itself, (a) directly from the surface, (b) indirectly through transpiration in the trees. The evaporation process is liable to often quite rapid modification in accordance with its sensitiveness to the variations in external climatic agencies. These however influence extensive land areas with varying conditions of the soil covering and, leaving them aside, recent experiments confirm the view that afforested conditions safeguard evaporation from sudden changes and conserve its effects and that the case is otherwise with open land or lands under other forms of vegetation.

The experiments conducted in Japan indicate that evaporation activity in the tree crowns varies according to the degree of saturation of the surrounding atmosphere. Evaporation of the solid forms of precipitation such as snow and hail gives in effect a contribution equal to that of the corresponding precipitation in liquid form. Direct evaporation from the land surface in similar external conditions is regulated by the circulatory power of the water in the soil, which in turn depends on the constancy of the land temperature according to the period of the year. In the warm season a high temperature stimulates the circulation of water in forest land even though accumulated at some distant previous date at a time of low temperature. The strong influence of litter on the elements which facilitate the circulation of the soil waters is thus confirmed. SERRATO (Mexico) has noted that on afforested land with the litter intact evaporation represents only 85 % of the comparable evaporation on lands not so afforested and that where the litter was removed the proportion fell to 61 %.

The evaporation process is closely connected with the question of the sources of supply for the underground water. On this point two theories are held, the one by French and the other by Swiss-German experts. The former school considers that rainfall is the principal source of supply, the latter that the chief source is to be found in the condensation of the air on contact with the soil, *i. e.*, through adsorption. DIENERT, the French authority, has recently reaffirmed the French theory, pointing out that supply due to the direct fixation of atmospheric moisture cannot be accepted until it is proved that air penetrates and circulates freely in the subsoil strata. Evaporation due to physiological transpiration in the trees themselves is dependent fundamentally on the specific capacity of the various species, though it is also well known that the requirements of particular species are readily modifiable and may vary between wide limits according to the amount of water actually available for evaporation. PAVARI (Italy) holds the view that it is not practically possible to make any true estimate of the amount of water evaporated from tree crowns when allowance is made for the variability of the transpiration process in accordance with the changes in external conditions. As regards Western Europe it may be assumed that as a rule the evaporation of the crowns of forest trees is on an average equivalent to 25 % of the rainfall retained in the soil. There is on the other hand sound reason for maintaining the view that afforested lands make sparing use of the precipitations which reach them, this being conspicuously the case in dry climatic conditions.

*Control of run-off and streamflow.* — In order that the capacity for retention may be constantly effective, it is necessary that the evaporation of the retained precipitations and the penetration of that part of them which is not evaporable should proceed regularly and continuously. Speaking generally it may be considered that such precipitation only as enter into the regular course of evaporation and form part of the regular supply of the deep lying waters affect the normal evolutionary process of particular land areas. Irregularity in local distribution of rainfall is not so much the result of general disturbances in the atmosphere as of ill balanced conditions in the local covering of vegetation on lands which have already reached a high stage of evolution. Instances of unsatisfactory permeability of the sub-soil and land skeleton should be considered as intermediary stages in the definitive formation of the land profile which is best adapted to secure an increasingly complete balance between external agencies and the gradual shaping of the relief. In such cases of imperfect permeability the reduced percolation gives rise to the phenomenon of surface run-off which is an essential factor in speeding up erosion. Where however the waters percolate freely and reach the strata where but little or no further

permeation is possible, subterranean flow takes place which is manifested on the surface, the superfluous waters being held in the depressions of the soil. It is naturally impossible to take into separate account the two forms of flow of the waters that are not retained in the land. The observations of the contribution of the declivities with varying types of vegetation is as a rule the only one attempted and is made at the level of the waters in rivers which receive water in all its forms. This contribution is expressed under the comprehensive title of the coefficient of run-off. Certain authorities are sceptical as to the value of these measurements for giving an idea of the influence of forests in determining this contribution and some attempt has been made to correct the results by introducing into the calculation the degree of the afforestation of the watersheds examined.

MAURICE PARDE, the French hydrologist, states that the coefficient of run-off gives the only key possible to the hidden cause of inundations. Variations in the coefficient depend solely on the extent of the power of retention shown by the land surface which in turn varies in accordance with concurrent meteorological phenomena. Human enterprise both agricultural and industrial may, according to the season, absorb some share of the precipitations or again increase their volume by some unexpected addition.

HIRATA's experiments in Japan led him to the following conclusions: 1. In the topographical, geological and climatic conditions of the drainage basins under observation the nature of the vegetation had no marked effect upon outflow. 2. In the years immediately following on the total deforestation of the basin, the increase in the amount contributed to the water-courses was equal to the fractional amount originally retained in the tree-crowns (19-21 %) and this increase gradually diminishes and vanishes altogether within a short period. It should be observed that natural regeneration was in no way checked after rapid deforestation. The experiments carried out at Wagon Wheel Gap in Colorado have shown that the land of a wooded drainage basin, when saturated with water as the result of the melting of the snows, shows a marked reduction in capacity for absorption, the contrary being the case with the heavy and prolonged autumn rains. The outflow of waters not retained in the soil was more rapid for such a basin after deforestation and in consequence the run-off at its lower extremity was more irregular than in the previous conditions. The Japanese series of experiments on the rapidity of outflow before and after deforestation have confirmed the view that temperature exercises considerable influence in this connection. After similar precipitations the flow slackened more rapidly in the basin divested of vegetation. In the basin which remained afforested the check on flow was more marked only when there was a rise in temperature, the contrary being the case for the cleared basin.

ENGLER, who made his observations on six watersheds in the Emmenthal, has shown that in the case of heavy general rainfall, three were uninfluenced as regards final outflow. In certain cases the outflow from the afforested basins was higher than where the basins were cleared. In shallow land surfaces saturation of the upper soil layers takes place rapidly despite wooded conditions. BURGER is of opinion that no general principle can be derived from ENGLER's results. According to his experience for 26 instances of prolonged general rainfall, in three cases only was the flow from wooded basins higher than the corresponding flow from unwooded lands. MARAN (Czechoslovakia) maintains that it is not true to say that a forest area, once saturated with water, forms an impermeable mass which no longer exercises any influence to check flooding. In every verified instance superficial run-off has always been less than on lands without vegetation. In special conditions determined by the coincidence of certain meteorological factors, the

outflow of infiltrated waters may be for the time being greater from wooded than from cleared lands and in such cases its coefficient may be remarkably high. DUGADOS and GAUSSIN (France) have recorded coefficients practically equivalent to 100 % from lands impregnated with winter rains in which saturation point was easily reached with the melting of the snow. Very high coefficients have also been registered when there has been a heavy accumulation of subterranean waters which have flowed over from the strata by which they are ordinarily retained.

*Erosion.* — The protection against the erosion of the soil surface produced by permanent and more particularly by arboreal vegetation is regarded as the best and longest recognised instance of the value of the influence of the forests. The important and authoritative experiments carried out by PENCK and CHITTENDEN and also by BURR, HARTS, MOORE, MUNNS, BATES and TEASMAN, BERNET and others have added greatly to the knowledge of the true nature of erosion and have without exception confirmed general opinion as to the value of the action of vegetation in controlling surface erosion, which is a highly important factor in the normal evolution of a land area. Erosion may bring about a sharp set-back in a long established stage of evolution especially with steeply sloping lands. This set-back is manifested in a rapid modification of the vertical section of the permeable vertical land section which has been attained.

In spite of the careful experimental methods followed, no measurements of erosion have been made on the site where the process was started in such a way as to give separate data for the influence of other frequently concomitant factors. Experiments made at Utah by SAMPSON, WEVI, and others, described by FORSLING in 1931, on drainage basins covered with bush and grasses have clearly showed that the influence of excessive pasturage on the resistance of the land covering to erosion is very marked.

On the other hand direct measurements of erosion with a proper control of precipitations, as regards duration, intensity and frequency, which were initiated in China in 1926 have been continued at Berkeley in California. For the very careful and detailed experiments made at Berkeley special run-off plots were designed at suitable altitudes with different types of soil and a surface slope of 30 %. Each plot was in two sections, one left in the natural state for purpose of control, the other being cleared. By means of carefully controlled apparatus the samples tested were subjected to artificial rains simulating natural rainfall as regards duration, intensity and wind accompaniment. Run-off and percolation waters were immediately collected and all necessary measurements and observations were taken. These experiments have gone far to show that forest litter holds the secret of the regulation of outflow. In all cases it serves to maintain the land section profile at its maximum percolating capacity and to secure a free circulation of the soil waters while at the same time checking the discharge of excessive infiltrations. At Berkeley it was proved that the capacity of forest litter to absorb water is only of secondary importance in the complex series of factors whereby the speed of outflow is regulated. Thus *the most important and chief function of forest litter is the maintenance of the land profile in the condition which is best suited in the particular environment for facilitating the infiltration of the rainfalls.*

LOWDERMILK (U. S. A.), describing the Berkeley experiments, is of opinion that it is now possible to lay down as follows a geological norm of erosion. Normal erosion depending on the natural vegetation mantle always becomes accelerated erosion when some artificial disturbance of the factors which control locally the development or evolution of the land section profile arises. Accelerated erosion is a

direct result of accelerated surface run-off and suffices by itself to establish the clear interrelation of the various processes of surface removal.

In the Berkeley experiments the tests were made for different groups of soil samples for a period of six months, during which 198 inches of artificial rain were applied in seven series of 10 runs each under different conditions of duration and intensity. Surface run-off in the samples from the burnt and cleared surfaces, was from three to thirty times greater than where they were covered with forest litter and the volume of eroded material was from five to six thousand times higher. The litter mantle continued to exercise its favourable influence on infiltration even after saturation point was reached. This fact was conclusively established by the application of 80 inches of rain, distributed in ten runs of 8 hours each within a period of 23 days. It was also demonstrated that the filtration of solid soil particles in muddy surface run-off as it percolated into the ground formed a thin layer determining the rate of percolation for the soil profile. This layer tended to seal the soil at the surface and hence the percolation capacity of the soil did not enter into the question. Where the forest litter remained this sealing was only partial as a result of the longer suspension of the soil particles in the water circulating in the litter which facilitate deposition on its ample surface.

As regards the varying quantities of the eroded material in accordance with the intensity and duration of the precipitations, the explanation is to be found in the relative fineness of the texture of the land surface and in this connection it should be remembered that the fineness of the soil texture is an important element in normal development. KOURTIKOFF, of the Agricultural Institute of Odessa, has recently shown that the condition of dispersion in a land surface has a decisive influence on its percolation capacity. He points out that such dispersion varies with temperature and other physical factors. The humus element also enters into the particles of the upper ranges of dispersion and, by reason of the variation in the mechanical composition of the soil at different levels, as a general rule percolation capacity diminishes with depth. Dispersion conditions are also related to the biochemical phenomena shown at different depth levels and in differing conditions of air or water circulation.

As the strata affected by erosion are forcibly displaced, their sudden dislocation, most marked at the lower levels, involves a modification in the evolutionary cycle of other land surfaces as the effect of the access of elements which in the normal course could not have been brought down by any form of mechanical transport but only as the result of long continued process of leaching and of complex wearing down.

In countries that have been recently settled, the effects of accelerated erosion followed by extensive deforestation have been manifested on a large scale. Artificial reservoirs of exceptional capacity, which it was anticipated could not be filled with sedimentary deposits for a long period of years have contrary to expectation, become rapidly choked as the result of accelerated erosion. It was useless to raise the heights of the containing dykes by way of defence, as the influence of this safeguard was quickly restricted owing to the increased degree of evaporation in the watershed consequent on the diminution in the depth of the water held in the reservoirs. An official enquiry by the State of Idaho into the facts as to the influence of the deforestation which has taken place during recent years in the Fortier and Blancy watersheds, showed that in the Hoover Dam district of the Imperial Valley from 283,000 to 268,000 tons of sediment are eroded annually and carried off by the waters of the Colorado, which frequently overflows its banks and deposits the sediment mainly on the cultivated plain lands. The enquiry showed that in the

mountains near the Boise River, the run-off waters from which are heavily loaded with mud, only 27 % of the total area of the watersheds can as yet be considered as immune from accelerated erosion.

The erosion which takes place on the summits of mountains follows its own special course on account of the more resistant quality of the material subject to the process. BLACHE (France) states that erosion differs in degree according to the height of the land reliefs affected. At moderate elevations the process is intermittent in its effects, being strong in certain sections and relatively weak in others, though in certain conditions it becomes generally uniform. On the other hand on very lofty mountain masses the eroding process is general and continuous over the whole surface and may also be arrested for quite lengthy periods.

\* \* \*

The references given here to numerous contributions by scientific observers are intended to give a clear idea not only of the trend and nature of the influence of the presence of forests on erosion and of the discharge of rain waters, but also of its quantitative effects. Their value consists in the fact that they make it possible for a clear distinction to be drawn between the origins of a number of phenomena connected with the influence of forests in maintaining and assisting in the evolution of the form of land relief which is best adapted for bringing about the biological reaction of a perpetual vegetation against any rapid levelling process of the land surfaces that have been formed.

There still remains the question of how and to what degree the principles established have been followed in the various countries in reconstituting forest growths in mountain areas that have been deforested either in recent times or in the more distant past.

S. CABIANCA.

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## Notices.

CONGRESS OF THE INTERNATIONAL UNION OF THE INSTITUTES OF FORESTRY RESEARCH, AT NANCY (FRANCE). — The next Congress of the International Union of the Institutes of Forestry Research has been arranged to take place at Nancy (France) from 4 to 11 September 1932. Before, during and after the Congress excursions will be made with the object of allowing members to make a study *in situ* of the principal types of French forests and of the methods of treatment followed.

The Congress will be divided into 6 sections viz.: (1) Forest Ecology and Silviculture; (2) Science of Forestry; (3) Tropical and Mediterranean forest problems; (4) Reafforestation and prevention of erosion in the mountains; 5) Pedological and Climatological Forestry; (6) Protection of the forests divided into 3 sub-sections:

- (a) Protection against forest fires;
- (b) Physiological and cryptogamic diseases of forest trees;
- (c) Forest Entomology.

As the Vth International Congress of Entomology will be taking place in Paris during the first fortnight of July 1932, the section of Forest Entomology of the Congress of the Forestry Research Institutes will meet at Nancy in the second fortnight of the same month, in order to allow forest entomologists to be present at both Congresses. Forest entomology surveys in various parts of France will immediately follow the meeting at Nancy.

According to established custom, the discussions will take place in English, French and German.

*Excursions.* — I. Before the Congress a survey tour, lasting about ten days, will be arranged, the object being to give a general view of the principal forest regions of France.

II. During the Congress one or two excursions will be made in the immediate vicinity of Nancy.

III. After the Congress, three tours, each lasting about a week, will be organised simultaneously in order to allow the members of the Congress to study more particularly a certain district or special type of the forests according to individual preference.

The objectives of these tours are: (a) The Vosges and Jura; (b) Prevention of erosion in mountains (the Alps); (c) The Mediterranean District.

For all further information application should be made to the President of the International Union of the Institutes of Forestry Research, M. P. H. GUINIER, Station de Recherches de l'École Nationale des Eaux et Forêts, Rue Girardet, Nancy, France

CONCLUSIVE RESULTS OF ELEVEN YEARS OF FOREST PROTECTION BY MEANS OF AIRCRAFT. — The vast forest areas which extend through Northern Quebec, Ontario and the Prairie Provinces to the Rocky Mountains, were, according to Mr. JAMES SPENCE of the Canadian News Bureau, in a note contributed to *The Empire Forestry Journal*, London, 1931 (Vol. 10, No. 1), the establishment of "wireless" and aircraft services, without adequate means of communication with the outside world. Slow and toilsome journeys by canoe in summer and dogteam in winter provided the only means of contact. Fortunately however these regions are well provided with landing surfaces in the form of lakes and waterways admirably suited to the operation of hydro-aircraft.

Shortly after the war a Government Civil Air Board was formed in Canada, and in co-operation with this Board, the Forest Service attached to the Department of the Interior, instituted trial operations in 1920, in Alberta with land machines and in British Columbia with flying boats. These and subsequent experiments in Manitoba showed that aircraft could play a very important part in forestry work and the employment of aircraft in this way was accordingly continued until 1930. By that time twenty four machines specially adapted for forestry requirements were operating from nine wireless-equipped bases, thus making provision for the detection and suppression of forest fires over an area of some 75 million acres in Northern Manitoba, Saskatchewan and Alberta.

The operation of aircraft is not confined to the summer and autumn seasons in Canada, but is also employed in the late winter months. From the beginning of March, ski-equipped planes patrol the northern forest areas of Manitoba and Saskatchewan, locating and extinguishing winter fires left by prospectors, fishermen or trappers.

In addition to the aerial operations carried out by the Federal Government, the Province of Ontario has developed a very efficient air force for forestry purposes. During the 1930 season some twenty-five planes were occupied in the Province in the protection and administration of the forests.

The writer adds in conclusion that, after eleven years' experience, there appears to be no doubt that, given suitable topographical conditions satisfactory means of ground communication and transports, a permanent system of fire lookouts, connected by telephone, offers the cheapest and best method of fire control. In the great northern forest regions however, where other means of securing early intelligence and swift transport are entirely lacking, aircraft is the only effective means of protection.

R. W.

FORESTRY IN HAWAII FOR WATER CONSERVATION. — The chief value of the forests of the Hawaii Islands (non-contiguous territory of the United States of America) lies in the water they conserve. An abundant supply of water is essential to the extensive sugar cane plantations of the Colony which are maintained by means of irrigation, and according to an article by C. S. JUDD in the *Journal of Forestry*, Washington 1931, No. 3, forestry is practised there for this purpose. Timber for construction purposes is imported from the United States; a native wood, *Acacia koa*, is used in small quantities for carpentry, etc.; the other native trees are of no commercial importance and some are dying out. Eucalyptus plantations which have been made in several parts of the islands are occasionally cut for posts and poles, and for fuel, but the main supply of fuel comes from the mesquite tree (*Prosopis juliflora*) which was introduced about 102 years ago and has covered more than 100,000 acres of arid tracts.

The first forest reserve in Hawaii was set aside in 1904; at the present time there are on the five largest islands 63 forest reserves, covering 1,021,314 acres. This forested area, which represents about 25 per cent. of the total area of the Colony is not considered too large to assure the crops of a water supply as well as to meet the needs of a growing population. Sixty-five per cent. of this area belongs to the Government; of the remaining 35 per cent. in private ownership, 21,288 acres have under the law been placed under the supervision and control of the Government for varying periods of time.

The heaviest average rainfall in the world, 476 inches annually is claimed to be found on the summit of the island of Kauai at 5,075 feet above the sea. On the windward or rainy side of the island of Hawaii, the rainfall alone is enough without irriga-



tion to grow sugar cane. On other parts of Hawai and on the other islands, the sugar cane fields are irrigated and the development of water supplies for this purpose is a matter of great importance.

The native forest must be kept intact if it is to be retained in a healthy state. The shallow-rooted trees depend on the undergrowth of bushes and ferns for the retention of moisture; and the destruction of the undergrowth by the grazing of goats, etc. produces conditions inimical to the health of the forest trees, which when thus weakened succumb to the attacks of insects and diseases by which they are not affected when the forest is not opened up or disturbed. The practical work of forestry accordingly consists in clothing the water-sheds with the best possible associations of trees, plants, and other vegetative cover for holding back excessive run-off. This is being accomplished: 1. by the demarcation of mountainous areas to be devoted to this purpose; 2. by getting rid of the wild stock still to be found in the forests; 3. by putting up fences to prevent the inroads of live stock; 4. by reforestation denuded areas.

Previous to the adoption of protective measures, the original native forest had been seriously depleted by the inroads of stock, and it is estimated that approximately 45,000 acres remain to be reforested, although some part of the area will become covered once more by natural regeneration. During the past 14 years, 1,281,562 trees have been planted out in forest reserves, every one with a ball of earth around the roots on account of the climatic conditions. This method ensured nearly 100 per cent. success. An average of 33,000 trees per month is being planted in different localities. Owing to the very varied conditions of the areas in need of reforestation, it is necessary to employ numerous kinds of trees and those from India and Australia appear to be the best adapted to the climate. Very few of the indigenous trees are used, because they are too slow of growth. Preference is given to introduced trees which reproduce readily by wind or bird transport of seeds. The kinds chiefly used in last year's plantings were: White ash (*Fraxinus americanus*); Paperbark (*Melaleuca leucadendron*); Silk Oak (*Grevillea robusta*); *Casuarina glauca*; *Sequoia sempervirens*; *Acacia koa*; Cypress (*Taxodium mucronatum*); *Terminalia myriocarpa*; *Casuarina quadrivalvis*; and Logwood (*Haematoxylon campechianum*).

The young seedlings are raised in trays, and pricked off into boxes filled with sterilised soil and can be used for planting six months from seeding. This method of planting is laborious but gives excellent results.

Seed has also been sown successfully over recent burnt and denuded areas by means of military aeroplanes.

This practice of forestry on the Hawaiian Islands is carried on entirely by appropriations made by the local Legislature with the exception of a contribution of two million dollars by the Federal Government of the United States for the co-operative distribution of planting stock to farmers.

R. W.

FORESTRY IN TRINIDAD AND TOBAGO. — The Forest Department of Trinidad and Tobago is responsible for the management of the forests in these islands (1), with the twofold object of ensuring the water supply and of maintaining an adequate yield of timber.

The total forest area of the Colony is about 600,000 acres. The two principal forest types are the Mora (*Dimorphandra mora*) and the mixed forests of Crappo (*Caraipa guianensis*) and Guatcare (*Lecythis laevifolia*). Among the other trees, Balata (*Mimusops balata* var. *Cruegeri Pierre*) and Cedar (*Cedrela mexicana*) yield timber which is in great request, but the stocks of these two valuable woods are relatively very limited, and consequently care must be observed in conserving them. On the other hand there are many different kinds of useful local timbers; at the Agricultural and Industrial Exhibition which took place in February 1931, the Forest Department exhibited a collection of more than 100 specimens of local wood along with seeds and small plants.

In connection with the work of identification of specimens which is always in progress, one identification was received in 1930, that of "bois lisette", which proved to be a new species of Mouriria (family *Melastomaceae*) and has been named *M. marshallii*.

In the course of 1930 stock taking was continued and carried out over approximately 54,000 acres; a new reserve was proclaimed and the survey of another with

1) See also *International Review of Agriculture*, 1930, No. 8, p. 317.

a view to water conservation was prepared. Regeneration operations were carried out over new areas and a working plan for the control of the yield of cedar was prepared over an area of 40,000 acres.

The Forest Department is paying special attention to the development of the Mora stands, as the Mora forest has at least ten times as many large trees (above six feet in girth) per unit of area as the mixed forest — crappo and guatecare — to which reference has already been made.

Research work on forest soils has been continued, especially in regard to the establishment of an evergreen ground cover in the plantations of *Cedrela mexicana*. The fact of the extreme rapidity with which, at least under Trinidad conditions, tropical forest soils deteriorate when the forest cover is removed has been amply confirmed by recent investigations.

The cut of local timber is estimated at 2,300,000 cubic feet.

The above information is contained in the *Trinidad and Tobago Administration Report of the Conservator of Forests for the year 1930, Port of Spain 1931*. Appendices to the Report give the estimated cut of the different timbers and a survey of timber resources per 1000 acres of stands together with the popular and scientific names of more than 100 different trees.

R. W.

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# MONTHLY BULLETIN

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## AGRICULTURAL SCIENCE AND PRACTICE

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No. 2

### GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

#### Miscellanea.

##### I. GENERAL AGRONOMY.

##### Meteorology.

ARTIFICIAL PRODUCTION OF RAIN. — Two American scientists, Profs. WARREN and BANCROFT, have successfully produced rain in a series of experiments based on the natural process which takes place in the upper atmosphere. In the upper atmosphere moisture is always present in the form of minute drops so light that they remain in suspension. When particles of dust come in contact with the drops of moisture they are absorbed, thus increasing the weight of the drops. As a result of their electric charge (positive or negative) the particles tend to become aggregated into masses too heavy to remain in suspension and then fall as rain. Thus clouds formed of vapour too light to fall as rain may be artificially weighted by electrically charged dust and immediate rain produced.

Acting on this theory a load of electrically charged sand was dropped from captive balloons on to clouds. Rain fell immediately.

Prof. BANCROFT calculates that 40 lbs. of electrified sand would be sufficient to dissolve into rain one square mile of clouds.

In subsequent experiments an aeroplane was used carrying sand with a charge, partly positive and partly negative, of 12,000 volts. The machine rose and disappeared among the clouds while spectators below awaited the miracle, which proved even more dramatic than before. The clouds burst in a violent shower of rain, while at the same time the sky cleared and the sun shone again.

In the Netherlands Prof. VERAAT has succeeded in producing rain over an area of about 8 sq. km. by a similar method, throwing finely divided 'dry ice', i. e., solid  $\text{CO}_2$ , from an aeroplane on to clouds. Similar experiments had been tried previously by various scientists using powdered kaolin, but had not given satisfactory results.

Prof. VERAAT rose to a height of 2500 metres in an aeroplane carrying 1  $\frac{1}{2}$  tons of 'dry ice' and fitted with a special spreading apparatus; he then let the powder fall on to clouds 200 m. below. Abundant rain immediately fell. The experiment was officially controlled by observers in 4 military aeroplanes.

Prof. VERAAT explains the formation of rain by supposing that during the fall from the aeroplane to the clouds the particles of solid  $\text{CO}_2$  become electrically charged and transformed into microscopic drops of liquid  $\text{CO}_2$ , which cause condensation in the clouds and consequently a fall of rain.

According to Prof. VERAAT this method will also make it possible to ensure fine weather when desired. By converting the clouds into rain early in the day he holds that a clear sky may be assured in a given locality for the rest of the day. (*La Meteorologia pratica*, 1931, Anno XII, N. 5, pp. 256-258).

T. B.

##### Soil Science.

EFFECT OF DRYING AND ULTRA-VIOLET LIGHT ON SOILS. — It has been shown by numerous investigators that the drying or partial sterilisation of soils may have marked effects upon their physical and chemical properties, as well as upon their crop producing power. In 1927 MORTENSON and DULEY, working at the Kansas Agricul-

tural Experiment Station, U. S. A., undertook to determine the relative effects of drying and treatment with ultra-violet light on the behaviour of soils. Separate portions of a fine sandy loam soil were dried in the sunshine in the open, in sunshine under glass, in the shade and in the oven at 100°C. Portions of soil dried in the sun and those dried in the shade as well as undried soil were treated with ultra-violet light. The soil was spread in a thin layer under a mercury vapour lamp and then at intervals of a few minutes a thin layer was removed from the surface, thus exposing a fresh layer of soil: at frequent intervals the whole mass was mixed. The ultra-violet light treatment of 2 kilos of soil varied from 15 minutes to 3 hours. The treated soils were compared in the laboratory and greenhouse.

*Effect on bacterial activity.* — The ammonia content of the soil showed a slight initial increase, which was greater where the drying or ultraviolet light treatment or a combination of the two had been most severe. After about 7 days the ammonia content decreased to a very low point.

The nitrate content of the soil was affected in the opposite direction. It became reduced immediately after treatment and then gradually increased for a period of several weeks. The average nitrate content as indicated by 7 determinations over a period of 97 days showed a decided increase for the drying treatments and a still further increase where ultra-violet light was used in addition to the other treatments.

The nitrate-producing organisms seem to have been injured more by the treatments than were the ammonifying organisms, hence the rise in ammonia immediately after treatment followed by a decrease as the nitrifying organisms increased the nitrate content of the soil.

The total number of bacteria as determined on agar media was reduced from 5,450,000 per gram in the untreated soil to about 3,170,000 in the soil treated with ultra-violet light, and to about 400,000 where dried in the sunshine. The ultraviolet light treatment, in addition to drying, reduced the numbers only slightly more than the drying treatments alone.

*Effect on the water-soluble calcium.* — The amount of water-soluble constituents of a soil have been shown by a number of investigations to be considerably increased by drying. This was found to be the case in this work and a still further increase was obtained by exposure to ultra-violet light. The amount of water-soluble calcium was almost doubled. The effect of the light was greatest on the undried soil and then decreased as the severity of the drying increased.

*Effect on the rate of settling of the soil colloids.* — Drying and ultraviolet light treatment both increased the rate of settling of the colloidal material. This may be due in part to their dehydration and in part to the increase in soluble salt content.

*Effect on growth of plants.* — Soils having the various treatments of drying and ultra-violet light were used in a number of tests for growing plants in the greenhouse. Very little effect was found for the various treatments on the growth of roots or tops of red clover or lucern. Previous work by DULFY and METZGER showed only very slight effect of ultraviolet light on wheat. Little effect of ultra-violet light was found on the number of nodules produced on lucern. This is similar to results since reported by ALBRECHT and TURK who found that *Bacillus radicicola* was not killed in a layer of soil 1/16 inch thick and exposed to ultra-violet light for 4 hours.

Further tests of dried soils and those treated with ultra-violet light should be made to determine more definitely the effect on plant growth, particularly since the work of LEBEDJANTZEV indicated that drying had a favourable influence. Such an effect might reasonably be expected since the nitrate content, soluble calcium content, and certain other chemical and physical properties of the soil were shown in this work to have been altered. It seems quite possible, according to the writers, that the ultra-violet radiation contained in sunlight may be sufficient to have some slight effect upon the properties of field soils. (*Soil Science*, Baltimore, 1931, Vol. XXXII, No. 3, pp. 195-198).

USE OF HYDROGEN PEROXIDE FOR ESTIMATING HUMIFICATION OF SOIL ORGANIC MATTER. — A method for determining the 'humified' portion of the soil organic matter by means of a 6 % solution of hydrogen peroxide was suggested by ROBINSON and JONES (*Journal of Agricultural Science*, 1925, Vol. 15, pp. 26-29) who considered that non-humified plant material was not oxidised.

The method has been critically tested at Rothamsted Experiment Station by RICHARDSON by observing the effect of 6 %  $H_2O_2$  on a number of fresh plant materials (grass, hay, straw, leaves, pine needles, sphagnum moss, etc.) with and without the presence of soil.

It was found that the solvent action of  $H_2O_2$  was far from negligible since the loss in weight after treatment varied from 16.8 % (barley straw) to 60.7 % (mustard tops) without soil, and from 21 to 65 % in the presence of soil.

It is thus concluded that the 6 % peroxide method can give only approximate results and that it is inadvisable to use it for comparing materials of widely differing origin. (*Soil Science*, Baltimore, 1931, Vol. XXXII, No. 3, p. 167-171).

AVAILABLE POTASH DETERMINATIONS IN HUNGARIAN SOILS BY THE METHODS OF NEUBAUER AND NIKLAS. — Having found by the *Azotobacter* method that the soils of the Sopron district are deficient in available phosphates M. G. VÁRALLYAY determined to test their potash content by NEUBAUER'S method (germinating seedlings) and NIKLAS' method (*Aspergillus niger*). He analysed at the Municipal Soil Science Laboratory at Sopron 42 soil samples from 5 farms of the district and obtained figures which showed the two methods to give similar results.

A potash content of 0.016 gm as determined by the NEUBAUER method (limiting number for a wheat yield of 30 quintals per ha) corresponds to a growth of *Aspergillus* of 0.6 gm on 5 gm of soil. A potash content of 0.022 gm as determined by the NEUBAUER method (limiting number for a sugar beet yield of 340 quintals per ha) corresponds to a growth of *Aspergillus* of 0.8 gm on 5 gm of soil.

Appreciable differences were found in the potash content of the soil of the 5 farms studied. The subsoil was found poorer in  $K_2O$  than the surface soil. Certain sandy loams were found poor in  $K_2O$  while certain sandy soils were rich in it. It is unusual to find lime-rich soils poor in potash, as soils deficient in potash are usually acid.

The method of NIKLAS is recommended as being less costly than that of NEUBAUER, certain and capable of giving indications also of the phosphate and nitrogen content of the soil. (*Mezőgazdasági Kutatószok*, Budapest 1931, IV évfolyam, 10. szám, p. 382-388).

T. B.

#### Fertilisers and Fertilising.

SOUTH AFRICAN WHALE GUANO. — South Africa is an important source of supply for whale guano (non-fat parts of the whale dried and milled). The exports from the Union of South Africa during 1929, the latest year for which complete statistics are available, were 7,510 short tons, of which Ceylon took 5,836 tons and the United States 1352 tons. In 1930 a decline was reported which is attributed to the low price of sperm oil. (*American Fertilizer*, Philadelphia, 1931, Vol. 74, No. 7, p. 30).

THE NITROGEN PROBLEM IN CZECHOSLOVAKIA. — The II<sup>nd</sup> International Nitrogen Conference (1928) formulated the following guiding rules to be followed in the establishment of synthetic nitrogen factories:—

(1) Factory sites should be chosen where nitrogenous fertilisers can be produced at lowest cost.

(2) Kinds of fertilisers should be produced which satisfy requirements of soil, climate and crops.

A factory fulfilling the requirements of point (2) must be able to produce synthetic ammonia. For low production costs the factory must have available hydraulic power.

The largest hydraulic power station in Czechoslovakia is the 'Hydrocentrale' of Kromeriz, which has turbines producing an average of 1900 h. p. and capable of giving 2700 h. p. It has a maximum annual production of 5 million hour-kilowatts. The other power stations of the country can between them develop 13,773 h. p., or 15,443,120 hour-kilowatts.

If the whole of this power is used for the manufacture of synthetic ammonia by the utilisation of the hydrogen produced by electrolysis of water, an annual production would be reached of only 1000 tons of combined nitrogen, which would not be remunerative.

Even after the building of the Fraine dam which will yield a hydraulic power of 17 000 kw and 90 million hour-kilowatts of electric power, it will not be possible to establish a synthetic ammonia factory utilising the electrolytic hydrogen because the costs of production would still be prohibitive.

Hydraulic power can thus be used for the production of synthetic ammonia only if the gasworks of Zbejšov are utilised as the source of hydrogen. The gasworks produce annually 600,000 quintals of coke and by utilising the hydrogen of the gas an annual production of 2500 metric tons of combined nitrogen could be obtained. (Dr. JAN HAMPL, *Sborník Československé Akademie Zemědělské* (Annals of the Czechoslovakian Academy of Agriculture), Praha 1931, Ročník VI, Číslo 1, p. 133-170).

MOVEMENT AND FIXATION OF PHOSPHATES IN THE SOIL, WITH SPECIAL REFERENCE TO THE FERTILISING OF PERMANENT GRASSLAND. — The following results have been obtained by MIDGLEY from a study of this important question.

Superphosphate applied as a mulch penetrates very slowly into the soil, for even after 6 months the greater part was found still in the surface inch. The maximum effect of superphosphate can thus be obtained only when it is incorporated with the soil. It was found that superphosphate well mixed with old turf increased the yield by 71.5 % more than when it was applied as a surface dressing.

The various phosphates tested differed in their behaviour in the soil. A layer of 19 mm of silt loam washed in a Buchner funnel with 750 c.c. of distilled water yielded no trace of  $P_2O_5$  from the contained superphosphate, whereas yields of 3.2, 3.3 and 88 % of the  $P_2O_5$  were obtained respectively from potassium phosphate, ammonium phosphate and sodium phosphate.

Alternating moisture and dryness are important factors in the fixation of phosphates in soils. When a 19 mm layer of soil mixed with the different phosphates was alternately damped and dried the solubility of the phosphates was reduced by approximately half by each alternation. Superphosphate was fixed 30 times more quickly than sodium phosphate by this means.

The movement of superphosphate through the soil is influenced by other fertiliser salts mixed with it. Sodium nitrate increased the rate of penetration, while potassium and ammonium sulphates slightly reduced it. (*Journal of the American Society of Agronomy*, Geneva N. Y., 1931, Vol. 23, No. 10, pp. 788-799).

STUDY OF MANGANESE IN TEXAS SOILS AND ITS RELATION TO CROPS. — Manganese is an essential plant food. A few calcareous soils in the eastern part of the United States are so poor in this element that it is the limiting factor of growth and applications of manganese sulphate increase the vigour and production of crops to a remarkable extent. This is notably the case in Florida (see this *Bulletin*, 1931, No. 12, p. 462).

In the west of the United States cases of chlorosis were also reported and a study of the question was undertaken by the Texas Agricultural Experiment Station. Soils from different parts of Texas were analysed for manganese, then 21 soils, some of which were reported to have produced chlorotic crops, were tested by means of pot experiments. In this work the effect of manganese sulphate on various crops (wheat, maize, cotton, sorghum, kafir) was tested by comparing the weight of crops which received complete fertiliser (NDK) with that of those receiving also manganese (NDKMn) and with that of a control crop receiving no fertiliser.

The following is a summary of the results obtained:—

(1) Texas soils can be divided into 3 groups on the basis of their manganese content: (a) the maximum content is in the Central and West (average = 0.05 % of acid-soluble Mn); (b) mean content in the East (average = 0.031 %) and South (average 0.027 %); (c) minimum content in the Western Plains (average = 0.024 %).

(2) Clay loam and clay soils were considerably higher in manganese than the sandy and sandy loam soils.

(3) A plant grown on one soil may contain 2 to 5 times as much manganese as the same kind of plant grown on another soil.

(4) On most of the soils tested manganese sulphate was not appreciably beneficial to the growth of crops; on one only was there a decided increase in growth. On 6 soils the yields decreased and the manganese sulphate appeared definitely toxic. If manganese is to be applied as a corrective for chlorosis it should be first tried out on a small scale.

(5) Of the 13 soils which produced chlorotic crops in the field only 2 produced chlorotic crops when tested in the greenhouse; on one of these manganese was of benefit to the growth of sorghum.

(6) An important point to be noted is that the addition of a complete fertiliser (NDK) containing no manganese to soils tends to increase the percentage of manganese in the crop. On some of the soils the fertiliser increased the amount of manganese in the crop more than did the application of manganese sulphate.

(7) The experiments showed that a crop of maize, cotton or kafir requires less than 1½ lb of Mn per acre, while a crop of wheat requires more than double that amount. While some Texas soils contain only small percentages of manganese the requirements of the plant are so small that the soil is much better supplied with manganese than with nitrogen, phosphoric acid or potash.

(8) With few exceptions manganese sulphate is not recommended for application on the soils of Texas. (*Texas Agricultural Experiment Station Bulletin* No. 432, 1931).

T. B.



## II. — CROPS OF TEMPERATE REGIONS.

**INFLUENCE OF SUPPLEMENTARY ARTIFICIAL LIGHTING ON THE GROWTH AND STRUCTURE OF CERTAIN CARYOPHYLLACEAE.** — Eight species of Caryophyllaceae were grown from seed to maturity under glass and the normal daily illumination prolonged by a continuous exposure to electric incandescent lamps of 10 to 20 foot-candles.

The experimental plants became taller than the controls, flowered earlier, had in many cases softer stems with less development of vascular tissue, particularly phloem. There was generally no starch in the pith or bark of the stem. The leaves were sometimes thinner than those of the controls, and in some cases had only one layer of palisade tissue, as in shade plants.

As a result of this continuous lighting certain species of *Agrostemma*, *Dianthus* and *Viscaria* were brought into flower very rapidly during the short winter days (F. RAMALFEY, *The Botanical Gazette*, Nov. 1931).

**ALBINISM IN WHEAT.** — In the *Italia Agricola* for November 1931 A. SUCCI reports the appearance of albinism in certain varieties of wheat in the spring of 1927. The varieties affected were the early varieties of STRAMPELLI (Mentana, Dante, Edda, Giglioli, Fabbri). White lines due to the presence of cells lacking chlorophyll occurred mainly on the leaf blades parallel with the longitudinal veins. In certain cases the leaf sheath, nodes and internodes were also affected.

Experiments showed that albinism is most common among plants which have a long hypocotyl or collar. At Voghera in 1931 it was found that seed sown by hand reached a better depth and the seedlings were thus less liable to albinism than machine-sown plants.

In 1927 albinism made its appearance in the wheat during the first phase of growth, whereas in 1931 it appeared later. Prof. STRAMPELLI thinks that in 1931 it was caused by sudden changes of temperature accompanied by cold winds. Experiments by Prof. POLLACCI showed that light was able to cause the disappearance of the white lines.

Profs. PIETRI and POLLACCI consider that albinism can be avoided by late sowing in autumn, abundant fertiliser to accelerate growth and by keeping the land in good condition. But it is generally recognised that the early wheats are more liable to albinism and in certain cases there is undoubtedly a hereditary tendency to it.

**RELATION BETWEEN THE SIZE OF CEREAL GRAINS AND THEIR FOOD VALUE.** — The opinion of G. TAJARICO that the food value of certain grains depends on their size has been confirmed by V. FAMIANI, who has shown by experiments on rats that the average growth rate is higher in animals fed with small grains. The mean gain in weight was only 91 % in male rats fed large barley grains as compared with 133 % in those fed small grains. (*Atti R. Accademia dei Lincei*, Vol. XV, Fasc. 7-8, 1931).

**CLASSIFICATION OF TOMATO VARIETIES IN ARGENTINA.** — In 1926 J. M. SCASSO and A. R. MILLAN undertook at the Agricultural Experiment Station of Morón the classification and description in accordance with the Code of Nomenclature of the American Society of Agronomy of New York, of 33 varieties of tomatoes. Some of these are local, others French and others come from the United States.

*Most productive varieties.* — "Pera colorado", "Ciruela amarillo", "Rey Humberto", "Incomparable".

*Earliest varieties.* — "Enano redondo", "Rey precoz".

*Best canning varieties.* — "Perdrigeon", "Conserva", "Gentil", "Chalk".

*Varieties most resistant to disease* — "Invulnerable", "Hendidon". (*Boletín del Ministerio de Agricultura*, Buenos Aires 1930, tomo XXIX, Núm. 3, págs. 267-296, 7 fig.).

D. K. & A. P.

## TROPICAL AND SUBTROPICAL AGRICULTURE

### Report of the Meeting of the Bureau of the Commission for Tropical and Subtropical Agriculture of the C. I. S. A. (16, 17 and 18 November 1931).

As already noted in a brief report in the December number of this Bulletin a meeting was held on 16, 17 and 18 November 1931 at the International Institute of Agriculture of the Bureau of the Commission for Tropical and Subtropical Agriculture of the C.I.S.A. (International Scientific Agricultural Council).

The Agenda were as follows :—

- (1) Methods of developing native agriculture (Reporter : Prof. MAUGINI).
- (2) Cultivation of cinchona (Reporter : Prof. LEPLAE).
- (3) Tannin-yielding plants. (Reporter : Prof. HEIM de BALSAC).
- (4) Selection of hevea (Reporter : Sir Wyndham R. DUNSTAN).
- (5) Suggestions for the work of the International Institute of Agriculture in the field of tropical and subtropical agriculture. (Reporter : Prof. LEPLAE).
- (6) Study of the resolutions of the Congresses at Antwerp, Paris and Seville with reference to the work of the International Institute of Agriculture. (Report presented by the Institute).
- (7) Documentation with a view to studying world production and consumption of coffee. (Prepared by the Institute).
- (8) Request from the International Scientific Association of Agriculture in Tropical Countries to the International Institute of Agriculture regarding the publication of monographs. (Note presented by the Institute).
- (9) Cattle plague and osteomalacia (Reporter : Prof. BISANTI, representing the " Office international des Epizooties " of Paris), and a Report on the Cattle Plague Enquiry (Presented by the " Office international des Epizooties ").

These lengthy agenda necessitated six meetings.

The first two items were discussed at great length.

Prof. MAUGINI'S report was very full. In summing it up he said that the development of native agriculture is a fundamental problem, being bound up with economic, social and political questions. The problem differs in different regions and must be studied under its two aspects of practicability and desirability. The first is related to physical conditions, the nature and state of development of the native population, and in studying it climate and health must be taken into consideration. The second aspect is more complex ; it is closely related with agricultural economics and with European cultural settlement in the Colonies. Agricultural economics and European settlement are liable to come into competition. Native farming is a family concern, capable of varying degrees of improvement, whereas the European colonists have business aims in view. Consequently if native agriculture is encouraged and developed along modern lines it may harm European planters. The agricultural relationship between the native and the planter differs in different countries and each case must be separately considered. The problem is of signal importance in view of the serious character of the present crisis. There may be grave results if native family methods of agriculture are supplanted by modern methods.

These considerations show that native economics should be thoroughly investigated before any attempt is made to modernise farming methods. The methods of modernisation need to be as many and as varied as the countries, the types of population, etc.

There are direct methods suitable for a population capable of taking an intelligent interest in development and there are indirect methods, such as compulsory labour, for more backward peoples.

In cases where the natives are in an advanced stage of civilisation it is sufficient for the Government to promote the development of the country. In less advanced countries various methods are necessary, such as propaganda, instruction, fiscal legislation. Taxation is not always successful, for it may lead the native farmer to give up ownership in favour of wage-earning or to sell his livestock to pay the taxes.

Where the native is too backward for any methods of encouragement to be effective, compulsory labour suggests itself as a method likely to be to his advantage. The problem of compulsory labour is a vexed question, but if the terrible famines

and epidemics of these backward peoples are considered it would seem that a colonising country should have the right to impose such compulsion. Also, seeing that all civilised countries accept the principle of compulsory instruction, why should not compulsory labour be accepted?

The methods of applying the principle are various and no hardship need be inflicted if the Government applies it in a spirit of humanity. To do it well further study of native conditions is necessary and more importance should be attached to the study of native economics, which so far have received only superficial attention. Italy started some time ago such a study of the real nature of native farm economics.

Colonial legislation should be based on a thorough knowledge of all these problems. Prompt action is needed in the present crisis.

Dr. MAUGINI's report was followed by a discussion in the course of which Messrs LÉPLAË, DUNSTAN, FAUCHÈRE and BALLY described systems already on trial for improving native agriculture. M. LÉPLAË gave the following account of systems of direct collaboration between the European and the native that are to be tried by his Government in the Belgian Congo. Each system is to be tried in two localities in order to gain a reliable test of its efficacy.

In the first or Horn system a law is passed by which a native community may form contracts for the delivery of agricultural produce. Such contracts are binding on all native members of the community whether in agreement with the policy or not. The State guarantees purchase of the goods and payment.

The second system is suited to the requirements of the Ruanda Urundi where the natives are very poor, live a pastoral life and desire for food only the products of the cow. To increase their income which is in general below 50 Belgian francs, districts will be selected for establishing a coffee factory or distributing seed, etc.; the produce will be distributed among the natives.

The third system is for use in the rubber and coffee plantations. There will be a central factory and plants will be distributed by the company in the villages round. When the trees are sufficiently developed the natives will be obliged to cultivate them. The profits from the sale of the products will be divided among the growers and the factory workers. This system has the drawback that for some years the natives will be obliged to work without gain.

In the fourth system a company will obtain a concession of land and will start a plantation of, say, coffee trees, where the cultivation methods will be taught to wage-earning labourers. At the end of two years the natives will be given a small area of land to work themselves, the produce of which they can sell to the factory.

A fifth system can be applied in certain plantations of, for example, cacao or oil palm. It may happen that a company cannot pay for the necessary labour for harvesting; it then puts the plantation at the disposal of the natives who harvest the produce and sell it to the company. There is thus complete liberty. For the success of this system it is obviously necessary that the natives should have sufficient desire of gain.

The sixth system is more advanced. It consists in grouping all the natives of a village and advancing them money. The seed is given and the crop sold for the profit of the natives. This system has the drawback of being very costly.

Reviewing the systems followed in the French Colonies M. FAUCHÈRE spoke first of the remarkable development of the cultivation of cacao in the Ivory Coast. Then he took the case of Madagascar with which he is particularly well acquainted. There one has to deal with peoples at different stages of development. Those in the centre are advanced; others, particularly those in the south-east, are not; those in the east are very indolent. But whenever a crop is a success the people apply them-

selves to it without constraint. This was the case with the Cape pea. Certain more difficult crops have required Government intervention, as was the case with tobacco. During the war the Government distributed tobacco seed and gave instruction in its cultivation. Now Madagascar exports 4000 tons of tobacco grown entirely by natives, who thus obtain a sure income. This result was achieved after at first exerting a slight pressure on the chiefs. The same result has been achieved with rice.

Native coffee growing has been developed as a result of European example. Planters are given 1.5 to 2 francs per kilo.

There are certain cases in which it has even been necessary to curb the zeal of the natives as, for example, for vanilla growing.

Recognising that the present crisis does not allow of an enquiry being addressed to the Governments, even if such a procedure would produce any valuable result in view of the enormous differences in the various Colonial populations, the meeting agreed to propose the following resolution :—

*" The Bureau having taken cognisance of the Report of Professor MAUGINI on the methods of the development of native agriculture in Tropical and Subtropical Countries, testifies to the urgency of the need for an international comparative study of the processes and of the results obtained through the different methods, whether recent or of earlier date, at present in use or proposed in the various Countries interested for developing native agriculture ; expresses the hope that the Permanent Committee will undertake to organise this international study and recommends that it should send a copy of Professor MAUGINI's report to all the Governments concerned and request these Governments to arrange to forward to the Institute any recent documentation published on the subject which does not reach the Institute in the ordinary course "*

At its meeting in December last the Permanent Committee accepted this resolution and a copy of Prof. MAUGINI's report is now being sent by the staff of the Section of Tropical and Subtropical Agriculture to the Governments concerned with the request that they shall transmit to the Institute any suggestions arising from it that they may consider useful.

The meeting then passed to the discussion of the second item on the agenda and M. LEPLAE spoke about malaria and the cultivation of cinchona in Central Africa. He emphasized the fact that Europeans living in tropical countries preserve themselves from malaria by the regular daily use of quinine, by using mosquito nets, by eliminating or covering with petrol any standing water, by clearing bush and plants with sheathing leaves and aquatic vegetation and by draining the land — all works in which the Italians are past masters.

But these methods are not applicable in the case of native populations because few of the tropical and subtropical countries can afford the vast expenditure entailed in draining and providing chemical treatment throughout their whole extent.

How is it then possible within reasonable limits of expenditure to exercise preventive measures against malaria in a native population ? This is the problem before the Commission.

The only method would seem to be to promote the cultivation of cinchona and the use of the alkaloids of the bark.

The problem thus becomes that of growing quinine producing trees in the malaria haunted tropics, and it must be realised that the species most rich in quinine, *Cinchona Ledgeriana*, is delicate and difficult to grow, while *C. Succirubra*, which is poor in quinine but rich in other alkaloids, is vigorous and capable of growing everywhere in the tropics.

It is thus necessary to determine whether the bark of *C. Succirubra* can in want of *C. Ledgeriana* be used in the preventive treatment of malaria. Dr. LUTRARIO, who is a malaria specialist, was able to answer this question arranging the various alkaloids in order of efficacy. In the first rank come quinine and quinidine, then cinchonine and in the third cinchonidine. But all four alkaloids are so similar that any one can be used in place of any other.

Two new preparations can also be recommended : « Quinetum », which contains quinine, cinchonidine and cinchonine in equal parts, which is approximately the proportion in which they occur in *C. Succirubra* ; and « Totaquina », which contains all the alkaloids of cinchona including at least 70 % of crystallised alkaloids, of which at least 15 % is quinine, in addition to amorphous alkaloids not exceeding 20 %, 5 % of mineral substances and 5 % of water.

The differences in the bark of *C. Succirubra* and *C. Ledgeriana* are chiefly in the proportions in which the different alkaloids occur : in *Ledgeriana* quinine is predominant, while in *Succirubra* cinchonine is much more abundant. But as cinchonine although less active than quinine is also an effective drug, *Succirubra* can be confidently grown and its quinine content can probably be increased as has been done with *Ledgeriana*.

In order to gain definite information about the efficacy of cinchona powder M. LEPLAË proposed that the Institute should request the Public Health Services of the various countries to undertake experimental work. The Bureau passed the following resolution :—

*“ The Bureau having taken note of the discussion on the use of cinchona bark powder or extract by native populations as a preventive and cure of malaria, is agreed as to the probability of the value of this form of treatment but recommends that the Institute should request the Governments concerned to institute in their respective Countries or Colonial Possessions and through their Health Services series of experiments which may enable the value of the remedy to be tested and to be good enough to forward to the Institute a report on all the results obtained ”.*

The Tropical and Subtropical Agriculture Section of the Institute was made responsible for giving effect to this resolution and for sending to each Government concerned a copy of the report presented by M. LEPLAË to the Bureau of the Commission.

Sir Arnold THEILER after giving an account of the present state of knowledge concerning osteomalacia expressed the wish that the Institute should give wide publicity to the facts and recommended that this should be done in consultation with the Bureau of Animal Health in London and the Bureau of Animal Nutrition in Aberdeen. M. BISANTI proposed that in consultation with the “ Office des Epizooties ” in Paris an enquiry regarding cattle plague and bone diseases should be organised. After discussion of the form the questionnaire should take it was agreed that a preliminary general enquiry should be sent out and that then a more detailed questionnaire should be drawn up in accordance with the replies received to the first.

The Bureau passed the following resolution : —

*“ The Bureau after hearing Sir Arnold THEILER’s account of the striking results of the experiments carried out in South Africa and confirmed also by American experiments as regards the causes and treatment of the diseases usually known under the title of osteomalacia and their importance for agricultural economics and being convinced that the methods recommended by Dr. THEILER and his assistants are calculated to increase*

*the revenue from stock in all tropical and subtropical Countries, resolves that the Institute should apply to the Bureau of Animal Nutrition for permission to publish in French an abstract of the results of the experiments and of the conclusions based thereon.*

*In the mean time it would be highly desirable to collect by means of a special enquiry as complete data as possible relating to osteomalacious affection in tropical and subtropical countries.*

*The questionnaire required should be prepared by experts who have high competence in the subject such as Prof. THEILER, Prof. BISANTI, etc., whose names might be recommended by the International Office of Diseases of Cattle the Enquiry being carried out in collaboration with this Office.*

*Cattle plague, which is exclusively a veterinary problem will not come under discussion ”.*

The Tropical Agriculture Section of the Institute was asked to apply to the Bureau of Animal Nutrition in Aberdeen for authorisation to translate into French and to distribute widely Sir Arnold THEILER's report summarising experiments carried out with a view to improving livestock production in tropical and subtropical countries.

The following meeting was devoted to a study of the proposed lines to be followed by the Institute in its work on tropical and subtropical agriculture and the cultivation of hevea.

M. LEPLAË held that the Institute's work in the field of tropical agriculture could be made effective if responsible agricultural officials of the Governments concerned could be present at conferences to cooperate with the technical experts in giving prompt effect to the measures recommended by the latter.

Further work for the Institute would be the preparation of a complete bibliography of publications relating to tropical and subtropical agriculture and to continue publishing the bibliographical notices which have been compiled by Dr. VAN HALL. The Bureau passed the following resolution :—

*“ The Bureau being aware that at present no really adequate bibliography of publications relating to tropical and subtropical agriculture is available and that the absence of such bibliography is a source of difficulty for the special studies and experimental research work concerned with this particular branch of agriculture recommends that the Permanent Committee should obtain the means required for publishing and continuing the comparative bibliographical notes collected by Dr. VAN HALL and covering the period 1 January 1931 to the end of December 1931 ”.*

In the discussion that followed Sir W. R. DUNSTAN's report on selection in the hevea the members of the Bureau were agreed in regard to the serious difficulties of the present situation. The scientists have left the improvement of the plantations to the planters themselves with the result that instead of enriching them they have ruined them. Considering however that this matter was not within the field of the discussions no resolution was put to the meeting.

The following day's session was begun with a discussion of the monographs to be published by the Institute.

M. HEIM de BALSAC gave reasons for desiring that a monograph on the tannin-yielding plants, specially the mangroves, should be prepared first of all. He supplied a detailed scheme for the monograph which should be published at the expense of the International Scientific Association of Agriculture in Tropical Countries. M. HEIM de BALSAC's recommendation was accepted and the following resolution passed by the Bureau :

" *The Bureau endorses the recommendation of M. FAUCHÈRE that the International Scientific Association of Agriculture in Tropical Countries should publish the monograph prepared by M. HEIM DE BALSAC on the cultivation of tanniferous plants* ".

A further meeting to be attended by representatives of the different Governments was then discussed and the text of the following letter prepared by M. LEPLAE, to be sent to the Governments requesting the presence of such representatives, was approved :—

" *The Bureau as a result of the discussions of 16, 17 and 18 November is of opinion that it is highly important that the Institute should within a short time call a reunion of the Bureau of the Commission for Tropical and Subtropical Agriculture and requests the Governments interested to be so good as to delegate as their representatives the chief officers responsible for Tropical and Sub-Tropical Agriculture in their respective Countries, Colonies or Dependencies, who may, by reason of their place of domicile or their presence in Europe on leave, be able to meet at Rome without the necessity for making unduly long journeys.*

*The recommendation of the Bureau was inspired by the sense of the serious character of the present crisis which is affecting Tropical and Sub-Tropical Countries even more severely than the Countries with temperate climates. The crisis may be said to be actually bringing about a falling off in native production and planters and plantation and stockraising Companies are severely affected.*

*All Tropical and Sub-Tropical Countries have either already initiated or are preparing schemes and have organised specific studies and enquiries with the object of checking the present setback in agricultural progress and of adapting agricultural methods to the new conditions resulting from the crisis, some of which may possibly be regarded as being of a permanent character.*

*The work already accomplished in this direction is of signal importance but is unfortunately but little known outside the particular territories in which it has been carried out.*

*The object of the proposed meeting is to initiate a movement for the establishment of a scheme of collaboration between Countries, Colonies and Dependencies in the particular field of Tropical and Sub-Tropical Agriculture.*

*Such collaboration must necessarily start from information regarding the steps taken by the Agricultural Departments, the difficulties encountered and overcome and the results already achieved or expected, combined with a comparative study thereof.*

*Such comparative study could undoubtedly be made on the basis of documents and correspondence but would be far more effective if carried out with the aid of personal contacts with those having most intimate knowledge of the conditions and requirements of the agriculture of each Country or territory concerned.*

*It should be understood that the purpose of the meeting is simply to obtain an exchange of mutual information and documentation and further that the opinions expressed on the occasion will be in no way binding on the particular Departments represented, each being able to judge for itself whether any particular method discussed may be desirable having regard to the circumstances of its own particular case.*

*The Bureau submits the following programme for the meeting as approved by the Permanent Committee it being understood that the Permanent Committee may also include any other question which may be suggested for discussion by any Department, provided that notification is received here before 15 March 1932.*

(I) DEVELOPMENT OF NATIVE AGRICULTURE. *Methods ; propaganda ; instruction ; contribution of agricultural work in lieu of taxes ; collaboration between natives and planters ; establishment of special industries in particular districts ; agricultural credit.*

- (2) ASSISTANCE FOR PLANTERS. *Agricultural credit. Reduction of taxes, transport charges and import and export duties ; premiums.*
- (3) ORGANISATION OF SPECIAL STUDIES IN NATIVE RURAL ECONOMICS.
- (4) BIBLIOGRAPHY of publications having reference to the Agriculture of Tropical and Sub-Tropical Countries.
- (5) DISTRIBUTION OF INFORMATION ON OSTEOMALACIA IN CATTLE".

The date of this next meeting was fixed by the Permanent Committee for 16 May 1932.

A second recommendation was presented to the Bureau by Prof. MAUGINI and the following resolution was passed :—

*" The Bureau being seized with the necessity for making more detailed and systematic studies of the economic position of native agricultural production in its various branches in tropical and subtropical countries, recommends that the Institute, in agreement with Professor MAUGINI, should arrange for the preparation of a questionnaire or scheme of enquiry for distribution among the Countries concerned so as to secure uniformity in the studies dealing with this question ".*

M. DORE, Chief of the Statistical Bureau of the Institute, then presented a report on the present situation in the coffee producing industry of the world. No resolution was formulated as the Bureau found that this question was not within its powers of action.

The sixth and last session was devoted to the final drafting of the recommendations formulated in the course of the discussions and to a study of certain points on the agenda not yet considered.

The resolutions of the Congresses of Seville, Antwerp and Paris were first discussed. The following resolutions were passed :—

(a) " CONGRESS OF SEVILLE.

*In connection with the establishment of a Coffee Bureau at Madrid the Bureau took note of the letter submitted by M. BILBAO which he had received from the Spanish Ministry of National Economy. In this letter the Spanish Government states that the Coffee Bureau has not yet been instituted since up to the present support has only been obtained from Belgium and the United States of Venezuela while 24 States, including Brazil at whose request the question of establishing the Bureau was raised, have replied in a negative sense.*

(b) CONGRESS OF ANTWERP.

*The first resolution of the Antwerp Congress relating to the development of native agriculture is at variance with Prof. MAUGINI's resolution. The Bureau recommends that the consideration of the second resolution be referred to the next meeting of the Bureau of the Commission of Tropical and Subtropical Agriculture.*

(c) CONGRESS OF PARIS.

*The Bureau expresses its full agreement with the first resolution. As regards the second resolution the Bureau recommends that the Institute should undertake to collect all forms of information relating to the cultivation of rubber and oil palms. The fourth resolution was referred to the next meeting of the Bureau. The Bureau calls special attention to the importance of the question raised in the fifth resolution.*

*The sixth resolution was considered at the same time as the third item on the Agenda.*



*After discussing the seventh resolution the Bureau takes due note of the desirability of arranging special studies on oil producing substances and the trade therein ”.*

Before the final closing of the discussions M. HEIM de BALSAC drew the attention of the meeting to the importance of a comparative study of the rodents that damage crops and foodstuffs in tropical and subtropical regions. He proposed that the subject “ Rodent vermin of tropical and subtropical crops ” should be placed on the agenda for the next meeting of the Commission. This proposal was seconded by M. LUTRARIO and the following resolution was passed :—

*“ The Commission endorses in principle the resolution passed by the International Rat Conference at Paris and suggests that the International Institute of Agriculture should transmit to the Governments a proposed form of enquiry regarding the damage done by rodents to crops and agricultural products for use in the various Tropical and Subtropical Countries ”.*

The Institute undertook to give effect to this resolution.

The Bureau then proceeded to the final drafting of the resolutions and the members adjourned with expressions of satisfaction at the success of the meeting and of hope for satisfactory future results.

The meetings were pleasantly diversified by the display of cinematograph films and lantern slides illustrating the Italian Colonies, the Belgian Congo, the French Colonies, osteomalacia and cattle plague, shown by Profs. MAUGINI, LEPLAE, HEIM de BALSAC and Sir. A. THEILER.

J. LEGROS.

## ANIMAL HUSBANDRY

### Miscellanea.

#### General.

FORMATION OF AN ANIMAL HUSBANDRY BUREAU IN SPAIN. — The Spanish Constituent Cortes has passed a law, dated 2 December 1931, creating an Animal Husbandry and Production Bureau under the Ministry of “ Fomento ”. This Bureau will combine all the previous services concerned with the study and practice of production, exploitation, improvement, industrialisation, medical treatment and management of animals and animal products which have been under the various Ministries of Public Instruction, of the Interior, of Agriculture, Industry and Commerce and of War, with the single exception of those under the control of the Military Veterinary Corps.

The work will be subdivided into 3 sections, viz, (1) veterinary instruction and social work, (2) stock farming propaganda, research and control and (3) stock hygiene and health. Each section will be under the direction of a General Veterinary Inspector.

The Ministry of “ Fomento ” will nominate a Commission which within 30 days will draw up on the basis of the various regulations now in force a system of regulations to govern the services of the Bureau and to distribute and co-ordinate the work of the sections.

STOCK FARMING PROMOTION IN ITALY. — A communication received by the International Institute of Agriculture reports that the governing body of the Group of Experts in Animal Husbandry and Cheese Production met recently at the headquarters of the National Fascist Syndicate of Agricultural Experts for the study of any problems of national concern.

The items of the agenda were discussed under the chairmanship of Signor VEZZANI giving special attention to those bearing on zootechnical experimental work and instruction. The organisation and promotion of stock farming and the possibilities of developing special features such as herdbooks, dairy cow testing, etc., were then discussed.

After discussing the effect of the recently adopted measures careful consideration was given to the present condition of the sheep, pig and poultry industries and a resolution was passed to the effect that these important branches of animal husbandry should be protected where necessary by measures to ensure their progressive development.

THE PASTORAL INDUSTRY IN RHODESIA. — The following interesting statements are extracted from the Report of the Director of Veterinary Research for the year 1930, (published in the *Rhodesia Agricultural Journal*, May 1931).

The present depression in agriculture has attracted attention to the possibilities of the pastoral industry, the prospects of which appear to be brighter than they have been for some time past. But it has to be admitted that the industry in this country is in a very backward condition and not at present in a position to avail itself of improvements in the world's markets should they occur. The total number of cattle is estimated as a little over two million head, that is, about one head to forty acres.

This unfortunate state of affairs is chiefly due to diseases. It is also an unfortunate fact that of the two million head the majority are too small and too slow to mature to find a permanent place in overseas markets. Great improvement is necessary in our local stock before it can hope to compete with animals from other countries.

The sheep industry also is in an equally unfortunate condition, our flocks being so mismanaged and diseased that during the past year it was necessary to import thirty thousand sheep from the south to supply the requirements of local consumption. Pigs, poultry, horses and dogs are also the victims of known and unknown diseases.

It will thus be seen that in the past the progress of the pastoral industry has been impeded by disease, and it is probable that its future development will be similarly handicapped unless an exact scientific knowledge is obtained concerning the diseases to which our stock are or may be subjected".

#### Genetics.

INHERITANCE OF HERNIA IN CATTLE. — WARREN and ATKINSON of the Idaho Agricultural Experiment Station publish in the *Journal of Heredity* (November, 1931) interesting observations on the inheritance of hernia in cattle.

An unusually large number of male calves with umbilical hernia appeared in two herds in which the same herd sire had been used. Twenty-one herniated animals observed in three herds were descendants of one common ancestor, and since no animals not descendants of the ancestor were found to be herniated, there is little doubt that the character is inherited. The defect seems to be sex-limited. Hernia appears to be a dominant character in males, but in females the mode of inheritance is questionable.

#### Feeding and Foodstuffs.

FEEDING SPINELESS CACTUS IN SOUTH AFRICA. — An animated discussion has arisen on the problem of whether or not the feeding of cactus can be recommended.

While in an article published in the November 18th (1931) issue of the *Farmers Weekly* it is stated that "from the purely economic point of view, resort to cactus, whether of the spiny or spineless variety, as a maintenance ration is of very doubtful value and that from the humanitarian point of view, the less said about it the better, for a more refined method of prolonged torture can hardly be imagined", another writer in the issue of 9th December of the same Review emphasizes the virtues of the innocuous spineless cactus.

The writer of the latter article has grown some spineless varieties and made successful experiments with this feed. No harm was observed to the cattle, nor can there be any question of torture. "The growing and feeding of spineless cactus is an immense problem", this writer states, "and fraught with vast potentialities" especially as it is available when animals are craving for green succulent vegetable matter during a protracted drought.

The Editor of the Review confirms that the leaves or slaps forwarded to him by the writer are without visible signs of the presence of spicules and could be handled with impunity, without fear of the prickles attaching to the most delicate skin.

ANIMAL HUSBANDRY AND MINERAL CONTENT OF NATURAL PASTURES IN KENYA COLONY. — During research into the mineral content of natural pastures of certain European areas of Kenya Colony commenced in 1926, it was observed that apart from one

area there was deficiency of all elements, particularly of phosphorus. In general it has been found that the poorer the pastures are in mineral matter the lower the carrying capacity, the slower the rate of growth of the young animals and the higher the incidence of disease. A pasture poor in minerals is ill-adapted for maintaining rapidly growing modern breeds in health. It is a general law in nutrition that the faster the rate of growth of an animal, the richer must the food be in constructive materials required for bone and soft-tissue formation. There is an equilibrium between the rate of growth of breeds of grazing animals and the mineral content of the pastures in the areas in which the breed is evolved.

Modern improved breeds of cattle with a rapid rate of growth have been imported to "grade up" native cattle without "grading up" of the pastures. The common result has been that, as the "grading up" process proceeds, mortality increases. The natural herbage which is able to support in health slower-growing native cattle which have evolved on this herbage is too poor in constructive material to support more rapidly-growing animals. The equilibrium between the grazing animal and the herbage is upset and the resulting mortality and sterility tends to the elimination of a type whose rate of growth and of production is greater than the herbage can support.

These statements of Prof. J. B. ORR (*The Composition of Pastures*, 1929) were fully confirmed during the recent research in Kenya Colony. (*The Fertilizer. Feeding Stuff and Farm Supplies Journal*, London, 1931, Vol. XVI, No. 13).

**MINERAL COMPOSITION OF THE FODDERS OF THE CENTRAL PROVINCES AND BERAR AND ITS BEARING ON ANIMAL NUTRITION.** — An article by A. R. PADMANABHA Aiyer and R. N. KAYASTH in the September issue of *Agriculture and Livestock in India* (Vol. I, Part V, 1931) discusses the composition of native grasses in the Central Provinces, which are very poor in phosphoric acid and calcium as compared with good pasture of England. Only grasses grown on heavy soils are rich in mineral content. The lime deficiency may not be so pronounced as phosphate deficiency for *guar*, *kadbi*, paddy straw and wheat straw, which form a good part of the ration, contain a high proportion of lime. The addition of an oil-cake helps to supply the phosphate deficiency and the lime deficiency, if any, can be made up by addition of leguminous fodder to the ration. Poor stunted growth of cattle may be due to the phosphate deficiency in the ration. Grasses in the Central Provinces are also deficient in nitrogen content. Growing and feeding of leguminous fodders such as berseem, *guar*, soybean, *kulhi*, *lahori* should be encouraged where possible, and in the rice tract, the rice polishing residues which are rich in phosphoric acid should be utilised as a cattle feed. In the wheat tract *bhusa* should form a part of the ration of the cattle.

**POTATO ENSILAGE.** — Potato growers often find themselves with surplus stock that they do not know how to use, either owing to insufficient livestock or to the potatoes being slightly damaged or diseased. Tubers that are thus unfit for marketing are still utilisable as stock feed but decay rapidly if not immediately used.

Ensilage is a simple and economic method of preserving potatoes until they can be used. At the Kirton Agricultural Institute (England) potatoes harvested in 1929 and put in the silo in 1930 were fed to stock during the winter of 1930-31 and during May, June and July 1931.

There are three methods of potato ensilage :—

(1) *Mixing the potatoes with green forage in a stack silo* — This method cannot be used until green forage is available in the spring. The ensilage can be used for cattle but not for pigs.

The potatoes are first screened to remove as much as possible of the adhering soil, then laid in alternate layers with the forage and the whole covered with a layer of soil. When the silo is opened the ensilage is found to have an agreeable odour; where the heat has been too great the potatoes are partially cooked, where it has been less the inside of the tubers is white and firm. There is little flow of liquid from the silo.

(2) *Cooking the potatoes and putting them in a pit silo.* — This method can be used at any time. Partially rotted potatoes may be preserved by this method. The ensilage is specially suitable as a pig feed. The pit should be 5 to 6 ½ feet in width and 2 to 2 ½ feet deep. The potatoes are boiled in a copper before they are laid in rows in the silo. The sides and top are covered with straw and a layer of soil 1 ft. thick placed on top. The potato ensilage thus prepared may be kept some months and may be fed to pigs without further treatment.

(3) *Mixing sliced raw potatoes with fermented maize* and using a similar silo to that in the preceding method. This method avoids the extra cost of cooking the po-

**SILVER FOX FARMING IN GREAT BRITAIN.** — In the *Journal of the Ministry of Agriculture* (October 1931) appears an article on silver fox farming in Great Britain, where this industry was started in 1920 with Canadian imported breeding stock. The writer (E. WITTE) states, that many breeders show a net profit of 60 to 65 per cent. on invested capital. Four hundred pounds per annum can be earned from five breeding pairs and a successful breeder can recover his outlay for foundation stock after one year, while a second breeding season enables him to cover all other expenses and at the same time allows him to increase his breeding stock.

This industry is encouraged, as a profitable side-line occupation which is of interest in view of the less favourable reports on the economic development of fur farming from other countries.

S. T.

## AGRICULTURAL INDUSTRIES

### The Ice Cream Industry (Part 1).

Ice cream was first prepared in Italy (by a different process from that used at the present day), then in 1550 was introduced into France. Two hundred years later it became known in England. In the United States it is first mentioned in 1786; in 1851 the first ice cream factory was established by Jacob FUSSEL in Baltimore. Between 1909 and 1922 the production of ice cream in the States became quadrupled. The consumption of ice cream in the United States is very great and in the winter is reduced by only 30 %. The remarkable development of the industry is largely due to the enterprise and commercial sense of the manufacturers who were not content only to improve the technique of manufacture but at the same time understood how to popularise the new product. The agricultural institutes, the universities and the press have all contributed propaganda in favour of ice cream consumption. At the present time several experiment stations are concerned with studying exclusively ice cream questions and regular courses in ice cream making have been instituted in the agricultural colleges.

The importance of ice cream not only as a delicacy but as a food, depends on the quality of the product on the market.

*Standardisation of ice cream in the United States.* — The following definition has been given:— "Ice cream is a frozen product made from cream and sugar with or without a natural flavoring and containing not less than 14 % of milk fat". Fruit ice cream and nut ice cream should contain not less than 12 % of milk fat.

The ingredients of ice cream vary in the different kinds within the limits fixed by commercial usage. In general the principal ingredients are:— (A) sugar and flavouring mixed with (1) pure cream or (2) cream and milk, or (3) milk with or without the addition of fat in the form of fresh butter or condensed or dried milk; to all these may be added the non-fat parts of milk in the form of condensed or dried skim milk; (B) homogenised mixture, sweetened and flavoured, of good fresh butter and dried milk (whole or skimmed) with water.

To all these mixtures are added gelatine or gum-tragacanth as harmless binders.

Normal ice cream should contain at least 8 % of milk fat and the content of the milk in fat and solids not fat should be at least 18 %, except when eggs, fruits, fruit syrups, cacao or chocolate, biscuits or nuts are used; in these cases a reduction of the minimum content of the milk in fat and solids not fat is allowed in proportion to the ingredient added.

Ice cream offered for sale is regarded as normal or of superior quality unless its kind, quality and content are indicated either on the package or, in the case of a part of a block, on a clearly visible label.

The following are declared illegal:— (a) any ice cream whose quality and content are inferior to those indicated; (b) any ice cream containing harmful or poisonous substances making it injurious to health; (c) any ice cream containing rancid butter or fat not milk fat or fat or oil foreign to the eggs and nuts contained in the ice cream or to the flavouring used; (d) any ice cream containing unclean or decomposed substances making it injurious to health, or in any way infected.

The following are declared false:— (a) any ice cream of which the designation on package or label is false or misleading or if some information required by law is missing; (b) any ice cream sold or offered for sale as the product of a maker other than the true maker or of which the label gives false information regarding the hygienic conditions of manufacture.

The heating of the mixture to 60° for 30 minutes is a general practice and even required in certain States.

*Definitions of food ices given by a Commission of the "Verein Deutscher Nahrungsmittelchemiker" and representatives of the ice cream industry.* — Food ices, called also "ices" are mixtures of sugar, water, whole milk, cream, eggs, flavours, etc., which are transformed by congelation into a plastic substance and kept in this state until the moment of consumption.

Amongst the substances producing particular flavours must in this case be understood natural aromatic substances such as vanilla, coffee, cacao, chocolate, walnuts, almonds, pistachio nuts, fresh fruits and preparations obtained from fresh fruits, which are added in distinctly perceptible quantities.

"Cream ice" contains whole milk, sugar, eggs and flavouring substances such as those specified above. For 1 litre of milk must be added at least 6 whole eggs or 6 yolks of egg (a minimum of 90 gm of egg yolk).

"Semi-cream ice" contains the same ingredients as cream ice, but for 1 litre of milk must be added 3 whole eggs or 3 yolks, i. e., a minimum of 45 gm of egg yolk.

"Fruit ice" must contain fruits either fresh or in the form of pulp or juice, in sufficient quantity. It is necessary to use pulps of the fruit named in the flavour of the ice in sufficient quantity, i. e., at least 200 gm of pulp to 1 kg of fruit ice, 100 gm to 1 kg of lemon ice.

By fruit pulp should be understood fruits that have been passed through a sieve. In place of fruit pulp can be used an equivalent quantity of fruit juice.

"Semi-fruit ice" is a product containing less or as little as half the quantity of fruit pulp or juice prescribed for fruit ice.

"Whipped cream ice" contains sweetened whipped cream and flavourings such as those for cream and fruit ice and sometimes also the constituent parts of eggs. The cream used must contain at least 28 % of fat.

Ice cream of the American type must be prepared with milk (natural or condensed or dried) cream or butter with the addition of flavouring substances. The final product must contain at least 10 % of milk fat.

Milk ice, like semi-cream ice, is composed of whole milk, sugar, and natural flavouring substances.

The use of colouring matter is forbidden in the types of ice mentioned above unless serving to colour pistachio nuts or fruit pulp. All colouring matter for fraudulently replacing egg is strictly forbidden.

The addition of a binder such as gelatine, gum-tragacanth or starch is allowed only in the proportion of 0.6 %.

Any preparation with a basis of sugar, water, milk, cream and egg but of which the other ingredients do not conform with the requirements of the law shall be given

the name of "cooling ices". In these ices also milk, cream and sugar must be used. Water may not be added to "fruit cooling ices". Yolk of egg may not be replaced by colouring matter.

*Ingredients of ice cream.* — Among the ingredients for making ice cream are in the first place milk and its products, the quality of which must not be inferior to that required in the dairy industry.

When cream with a fat content of 30 to 40 % is used as the principal ingredient condensed skimmed milk is generally added to give the necessary body. Sweet frozen condensed cream can also be used. Experiments carried out at the Massachusetts Experiment Station have shown that good quality sweet cream will keep for several months at 0°F (—17.8° C.) or below. An ice cream of satisfactory flavour can be prepared with frozen cream when this forms 3/4 or more of the fat content of the mixture. Mixtures prepared with such cream have a greater viscosity, due in part to an excessive agglomeration of the fat globules after homogenisation. This cream requires 10 to 20 % longer beating time. The addition before freezing of a little gelatine or sugar reduces the viscosity and the time required for beating the cream.

If sufficient cream is not available melted unsalted butter may be used as a substitute. Powdered milk may also be used as a substitute for condensed milk.

The use of dried skim milk in ice cream making has been studied by C. DAHLGREN and J. KERTH. The following results were obtained.

If good quality dried skim milk is used in mixtures containing cream and milk the resultant ice cream obtains in grading as many points as a control sample prepared with condensed skim milk. With dried skim milk and butter the number of points is lower than if ice cream is used. Mixtures of butter and skim milk powder take longer to reach the required bulk than mixtures of cream and dried milk.

As regards flavour, consistency and texture good quality skim milk powder may be satisfactorily used to replace condensed skim milk in a mixture containing cream and liquid milk as a source of fat.

For sweetening cane and beet sugar are used, though the latter more rarely. During the war maize sugar and various kinds of syrups were also used. A mixture containing too much sugar has a low freezing point and is therefore difficult to keep in good condition in the shop. The optimum sugar content is between 13 and 14 %.

The use of honey in ice cream making has recently been studied by TRACY, RUCHE and SANMANN. Experiments showed that honey could be used to replace 50 to 100 % of the sugar. It is not however considered advisable to replace more than 75 % of the sugar by honey because of difficulties in freezing. It was shown that a minimum of 9 % of honey is required to give an appreciable flavour and that 14 to 18 % gives more satisfactory results. If honey is used as the only sweetener 16 to 18 % is necessary.

No difficulty was found in the pasteurisation of mixtures containing honey. As a general rule honey ice cream has kept well for some weeks except when air has got in.

The addition of beeswax to the honey has no effect on the flavour. Honey ice cream usually costs more than vanilla ice sweetened with sugar but less than the majority of fruit ices.

Cacao and chocolate in powder, blocks or syrups are used. The purity of these products is guaranteed by legislation. Syrups are available on the market containing the necessary quantities of sugar and vanilla. The use of prepared chocolate syrups in making chocolate ice cream has not yet been studied. CAULFIELD

has compared various types of chocolate syrups to determine how they affect the composition and congelation and flavour of a standard mixture. The chocolate syrup was found to increase the time required for beating and congelation and to lower its consistency during preservation before sale.

N. E. FABRICIUS studied flavourings for chocolate ice cream and found that a good quality cacao is preferable to chocolate extract or syrups. The addition of ingredients such as cinnamon or caramel alters the flavour rather than improves it. The improvement obtained by the addition of vanilla essence is not sufficient to justify its use.

Fruits are available to the ice cream industry as fresh, cold-pack, canned, dried, and candied fruits; fruit juices, fruit syrups, concentrates, jams, preserves, and, to a limited extent, fruit powders.

Investigations at the University of California on the use of fresh fruits in ice cream have shown that the present California State legal minimum of 3 per cent. of fruit in fruit ice cream is altogether too low. It is impossible to prepare ice cream having a flavour characteristic of the fruit when such a small proportion is used. It was also found that the fruit must be thoroughly ripe in order that it may be broken up during freezing. The larger pieces of fruit when too firm or not finely ground, become hard and "icy" in the cream, because their freezing temperature is so much higher than that of the cream. Some fresh fruits not heretofore used commercially in ice cream were also used successfully in the experiments. The best of these were fig, persimmon, and avocado.

Strawberries, raspberries, and blackberries are stored at freezing temperatures in commercial quantities for the fruit preserve and ice cream industries. Previous investigations have demonstrated that most of the berries and deciduous fruits grown in California can be preserved with practically all of their fresh flavour and colour, when properly prepared and stored in sealed containers at 15°F or less. While freezing storage softens the fruit texture, this softening in no way injures, but rather improves, the value of the fruit for use in ice cream.

While canned fruits are not generally used in ice cream at present, several varieties were used in the experiments and gave excellent results. They are much less costly than the same fruits specially prepared for the ice cream industry and are equally good or better for the purpose.

Fruit preserves specially prepared for the ice cream trade as well as those prepared commercially for the table were used experimentally in ice cream. The principal objections to most of such preparations are their high cost and high sugar content. Pie grade canned figs, apricots, pears, and peaches are much lower priced than the corresponding fruit preserves and more suitable for use in ice cream. When sufficient of the ground fruit preserves was used to impart to the ice cream the characteristic fruit flavour and appearance, the high sugar content of the fruit so depressed the freezing point that a too soft ice cream was obtained. Berry preserves were open to the same objections and were found to be considerably less desirable than the cold-pack (frozen) berries for use in ice cream. For these reasons, the cold-pack and commercially canned fruits are to be preferred to the fruit preserves.

Fruit jams for the table are usually made by cooking together about equal weights of crushed fruit and sugar, and usually contain more than 50 per cent sugar when cooked. A number of fruit jams were tried in ice cream but the objections of high cost and high sugar content found with preserves applied with nearly equal force to jams. While they can be used, they are much less satisfactory and are more costly than the corresponding pie grade canned fruit and cold-pack fruits.

Cherry ice cream made with cherries prepared by the maraschino process is of considerable commercial importance, and most factories have found satisfactory methods of making cherry ice cream.

Orange juice is the only fruit juice that is very well suited to use in ice cream. Although grape, berry, and other fruit juices and also syrups and concentrates made from them, were used in ice cream with fair success, they were much more satisfactory in water ices.

Considerable quantities of candied fruits are used in special ice cream such as *tutti-frutti* and in frozen puddings. The broken, ground or chopped candied fruits, representing wholesome fruit unsuitable for packing for the candy trade, can be purchased at moderate cost from candied fruit factories or ice cream supply houses.

Of the dried fruits, prunes and raisins appear to have the greatest commercial possibilities. While dried apricots, peaches, and figs can be used in ice cream, the canned and cold-pack fruits of these varieties are much better for the purpose and much more convenient to use.

Vanilla is the chief of the aromatic substances used. It is used alone or as a basis for other flavours. Its liquid forms are all stable and show no tendency to disappear during the period of storage. Mexican pods only should be used for vanilla extraction.

There is legislation regulating the use of "stabilizer" and "filler" substances for ice cream not intended for immediate consumption. Gelatine and gum-tragacanth give stability but egg gives also more palatability.

MARTIN and CAULFIELD have also studied the use of egg as an ingredient in ice cream. Yolk of egg is found to increase the speed of frothing during congelation, and thus to reduce the time required for congelation. The comparison of fresh, frozen and dried eggs shows that fresh egg has most effect on congelation, while dried is superior to frozen egg yolk. Fresh and frozen yolks increase the rate of congelation when added to the cold mixture before ageing. To insure uniform incorporation however it is advisable to add the egg immediately before homogenisation. Egg yolk reduced the time of congelation more with mixtures on a basis of butter than with those on a basis of cream or cream and butter, and more with mixtures having a low than a high fat content.

The necessary time of beating a mixture rich in the solid parts of the whey is reduced more by the addition of egg yolk than is that of a mixture poor in these substances. White of egg has no effect on the time of congelation while the salts contained in the yolk may partly explain the reduction in the time of beating which is produced by the addition of egg yolk.

As regards the quality of the ice cream the addition of egg yolk does not usually justify the increased cost.

*Gelatine.* — One of the most important physical properties of ice cream is its texture, or in other words, its smoothness to the taste. This is caused principally by the size of the water crystal — obviously small water crystals producing an ice cream that is smooth to the taste and large water crystals one coarse to the taste. Several factors influence the size of the water crystals, but probably no single factor has greater influence than the gelatine content of the ice cream.

A careful experiment was made by MOJORMIER and TROY to determine the proper limits of gelatine to use. A quantity of ice cream mix was prepared testing 8.00 per cent fat, 12.50 per cent milk solids not fat, 13.00 per cent sugar, making 33.50 per cent total solids. This was divided into different lots and these in turn handled as shown in the following table. The various lots were all frozen quickly,



and then transferred to a hardening room with temperature around 0° F., and kept therein for the time indicated in the table.

The results given in the following table prove the value of adding gelatine to ice cream. The best results were obtained by adding .50 per cent. gelatine to the mix before pasteurizing. Gelatine usually contains only about 83.00 per cent of total solids. The addition of .60 per cent of gelatine will provide about .50 per cent. of the water free substance. An excess of gelatine produces an ice cream that does not melt readily upon the tongue, besides it unnecessarily increases the cost of the ice cream.

How mix was treated	How gelatine was added	Percentage gelatine added	Condition of ice cream one day after freezing	Condition of ice cream eight days after freezing	Numerical quality Rank of various lots of ice cream at end of 8 days
Pasteurized at 140° F. held for 4 days at 40° F.	Before pasteurizing	.50	Smooth	Smooth	1
Not pasteurized held for 4 days at 40° F.	After holding 4 days. Just before freezing	none	Coarse, grainy	Coarse, not fit for sale	6
"	"	.20	Coarse	Coarse	5
"	"	.40	Slight grain	Coarse	4
"	"	.50	Smooth	Smooth	2
"	"	.60	Smooth	Smooth	2
"	"	.70	Smooth but ice cream did not melt readily	Smooth but slimy	3
"	"	1.00	Smooth but ice cream did not melt	Slimy. Not fit for sale	6

The possible influence, if any, that gelatine may exert upon the crystallization of the milk sugar is not known at this time. It would be theoretically possible for the gelatine to retard the crystallization of the milk sugar, as well as the crystallization of the water.

*Water.* — The water content of ice cream influences both its chemical and physical properties. Excessive water impairs the food value of the ice cream. The maximum limit under good practice is 67.00 per cent. water, corresponding to 33.00 per cent. total solids. The minimum limit is 60.00 per cent. of water corresponding to 40.00 per cent. total solids.

The influence of the water content upon the physical property of ice cream is usually not fully understood nor fully appreciated. It is the size of the water crystals that determines the texture or smoothness of the product.

The best work reported to date upon this subject is that by HALL. It is doubtful if over 70 per cent. of the water in ice cream is ever frozen. No matter at what temperature the ice cream may leave the freezer, freezing in the hardening room continues.

HALL recommends placing the ice cream as it comes from the freezers in a hardening room of very low temperature, say —15° F. Then after the ice cream has hardened, transferring it to the regular hardening room with temperature of about 5° F. He further points out the fact already recognized by many manufacturers that small cans on account of being quickly frozen, usually contain smoother texture cream than large cans.

The sorts of ice cream prepared with the ingredients mentioned are naturally various. According to LICHTENBERGER the products of the American ice cream industry may be defined as follows:—

(1) "Philadelphia Ice Cream" is composed of cream, milk in various forms, sugar, fruits, flavourings and gelatine. It constitutes 9/10 of the total ice cream production of the United States.

(2) "Neapolitan Ice Cream" or "French Ice Cream" is based on cream, milk in various forms, sugar, flavourings and eggs.

(3) "Mousse" is formed of cream with a high fat percentage, flavourings and sugar, the whole beaten up and then frozen

(4) "Water Ice" is made of fruit essences and sugar. It is a product of varying food value and too cold to the palate.

(5) "Sherbet" is composed of dilute fruit syrup, sugar and eggs, frozen.

E. GASSER.

(To be continued).

## Notice.

**VIIth International Cold Storage Congress, Buenos Aires, 1932.** — In accordance with the resolution passed by the last International Cold Storage Congress which was held at the International Institute of Agriculture in Rome in 1928, the President of the provisional Government of the Republic of Argentina has arranged for the VIIth Congress to take place at Buenos Aires from August 27 to September 10, 1932. In agreement with the permanent governing body of the International Cold Storage Institute the Congress will be concerned with the following questions: — (1) Scientific questions — (2) Refrigerating plant — (3) General uses of refrigeration — (4) Cold storage during transport — (5) Legislation and regulations — (6) Instruction and propaganda — (7) General economy and statistics.

During the Congress the principal cold stores of Buenos Aires, La Plata and Rosario will be visited, as also the chief farming establishments of the province.

In view of the importance of the Argentine Republic as a meat producing country and its world supremacy in meat exportation the Congress will be of particular interest and will be attended by representatives of the chief European meat importing firms.

Further information may be obtained from Dr. Carlos Alberto ERRO, Secretary of the National Executive Committee, Paseo Colón 940, Buenos Aires.

## BOOK NOTICES (1)

*Literatursammlung aus dem Gesamtgebiet der Agrikulturchemie*, herausgegeben von Prof. Dr. H. NIKLAS und Dr. A. HOCK: Band I, *Bodenkunde*, Weihenstephan 1931, 1008 p. & Band II: *Bodenuntersuchung*, 1931, 199 p.

[To avoid duplication of research and the consequent waste of time and money it is essential for every scientist to keep in touch with the work being carried on elsewhere in his particular branch of work. This however is becoming increasingly difficult in view of the number of periodicals publishing research reports in every country and bibliographical summaries are more and more necessary.

Professor NIKLAS (Institute of Agricultural Chemistry, Weihenstephan, Bavaria) has undertaken the enormous work of compiling such a bibliography covering in 6 volumes the whole field of agricultural chemistry. The first 2 volumes, dealing respectively with *Soil Science* and *Soil Investigation*, have appeared. The 4 following volumes will deal with Plant Nutrition, Fertilisers, Agricultural Bacteriology and Stock Feeding.

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(1) Under this heading short synopses are included of books sent for review.

Volume I, *Bodenkunde* (Soil Science) (dedicated to Profs. F. SCHUCHT and E. BLANCK), has been prepared by Prof. NIKLAS in collaboration with Dr. CZIBULKA and Dr. HOCK. The bibliographical matter is subdivided as follows: — (1) General matter (2) Soil origins (3) Soil chemistry (4) Soil physics (5) Relation between soil and vegetation (6) Soil classification and mapping (7) Soils of the different countries in the world (8) Composition of mineral ores, rocks and various soils. Soil microbiology will be dealt with later under *Agricultural Bacteriology*.

Volume II, *Bodenuntersuchung* (Soil Investigation), prepared by the same authors, covers (1) General questions relating to soil investigation (2) Sampling methods (3) Chemical analysis (4) Physical analysis (5) Microbiological analysis (6) Microscopical study of soil (7) Study of soil minerals (8) Study of rocks.

These volumes will be of inestimable value to all workers in soil science.]

*Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists*, compiled by the Committee on editing methods of analysis, Third edition, 1930, 593 p., reference tables. Published by the Association of Official Agricultural Chemists at Washington, D. C.

[The Association of Official Agricultural Chemists was founded in 1884 and includes the following institutions: State Departments of Agriculture, the State Agricultural Colleges and Experiment Stations, the Federal Department of Agriculture, and the Federal, State and City offices charged with the enforcement of food, feed, drug, fertiliser, insecticide and fungicide control laws.

To attain the aims of the Association for a set of accurate methods having official value before the courts the methods are subjected to the most rigorous scrutiny before they can be adopted. A new method in order to be adopted as "tentative" must be recommended to the association by a referee; it must then in order to become "official" be again accepted at another annual meeting. These facts show the value of the methods described in the volume.

The arrangement is similar to that of the first and second editions but there are certain alterations and additions, necessitated by the progressive development of the work. The subject matter is broadly grouped into two divisions, non-foods and foods. The first division includes chapters on Soils, Fertilisers, Liming Materials, Insecticides and Fungicides, Caustic Poisons, Naval Stores, Paints, Leathers, Tanning Materials and Plants. The chapters on foods are arranged in alphabetical order:— Baking Powder, Beverages (non-alcoholic), Beers, Wines and Distilled Liquors, Coffee and Tea, Cacao Bean and its Products, Cereal Products, Colouring Matters in Foods, Dairy Products, Eggs and Egg Products, Flavouring Extracts, Fruits and Fruit Products, Grain and Stock Feeds, Meat and Meat Products, Metals in Foods, Oils, Fats and Waxes, Preservatives and Artificial Sweeteners, Spices and other Condiments, Sugar and Sugar Products, Vegetables and Vegetable Products, Waters, Radioactivity, Drugs.

The volume concludes with 26 reference tables of data for use in analysis, an appendix containing definitions of terms relating to fertilisers and liming materials and a general index. References are given at the end of each chapter.

The Association is planning to include chapters on Sewage, Fibres, Paper and Paper Material, Fish and other Marine Products, Nuts and Nut Products, Vitamines, Bacteriological Methods, Microchemical Methods, etc.].

#### GRAIN CROPS\*

TALLARICO G., *Il grano come alimento e come semente*, 329 p. — Memorie della Reale Accademia d'Italia, Classe di Scienze fisiche, matematiche e naturali, Volume III, Biologia: N. 1. Roma 1931-X, Tipografia del Senato.

[This interesting memorandum on wheat as food and as seed describes a series of experiments on the cultivation of wheat for quality carried out from 1925 to 1931 on the experimental farm at Montagnapiana in Calabria.

The writer studies wheat in the two aspects of its food value and its genetic history, and divides his work accordingly into two broad divisions:— I. *Wheat as food*, subdivided into (1) composition of the grain and experiments relating thereto, and (2) factors influencing the composition and experiments relating thereto. II. *Wheat as seed*. This division includes, after an introduction giving bibliographical references, the following 5 parts:— (1) physiological predetermination in wheat: treatment of the mother plant; (2) physiological predetermination in wheat: treatment of the resting seed; (3) physiological predetermination in wheat: treatment of the germinating seed; (4) green manure

crop turned in at opportune time (early spring) and its use in growing wheat in the south ; (5) conclusions and bibliographical references.

Under the aspect of food value the writer studies first the formation and development of the grain, its physical constitution and the functions of the different parts, the biochemical value of the constituent parts, the proteins of the grain, its vitamins, its plastic salts, its catalytic salts, its enzymes, the relation between the size of the grains and their food value and the biological value of germinated and non-germinated grain. He then discusses the factors affecting the composition of the grain, namely hereditary factors, climatic factors (temperature, water), light, soil and fertilisers.

Treating the genetical aspect the writer emphasises the value of physiological pre-determination as affecting the development and productivity of the wheat plant by its action at 'critical points' in its life history, viz, (1) first stages (while still on the mother plant) : of gamete, zygote, forming and maturing embryo ; (2) resting stage : dry seed ; (3) critical stage of renewed life : germination. But these are biological processes. In practice a simple and original method of obtaining any wheat stock, improved or otherwise, in good growth with high yielding capacity, consists in growing the mother plant in unfavourable conditions, different from the normal conditions].

#### AGRICULTURAL MACHINES.

SCHNELLBACH O., Landmaschinen in Chile, 81 p. Oderberh, Mark, 1931, Buchdruckerei Fritz Müller.

[On the use of farm machinery in Chile, in which country the author has had long experience.

After a description of the soil and climate and agricultural conditions in Chile the importance of farm machines is discussed with reference to private and national economy.

The northern part of the country is entirely consuming, the saltpetre producing region being devoid of plant growth, but the southern part is entirely agricultural. Increased production is desirable from the point of view of national economics for the sake of providing for the needs of the north.

Up to the present very little machinery has been used on the farms. An idea of the characteristic mentality is given by the fact that in many parts the corn is still trodden out by horses. The introduction of machinery is however increasing.

The climatic conditions of Chile are very similar to those of California, the original home of the harvester-thresher, and greatly favour the introduction of the machine, which will probably shortly oust all other methods of harvesting.

Nearly all the agricultural machines used in Chile are of foreign manufacture, mostly coming from the United States. France has the lead on the market for vineyard machinery, and Germany for heavy oil engines and tractors. The undesirability of depending on foreign goods particularly fuels for tractors and petrol engines, as regards national economics cannot be denied, and Chile is thus following with interest the attempts being made in France, Germany and other countries to obtain a well-tested gas generator.

Finally it may be said that it is only by means of machines that Southern Chile will be able to increase her production and supply the needs of the desert region of the north. The increased use of machinery is desirable also from a social point of view, to alleviate the drudgery of manual labour and thus allow the workers to give time to other concerns].

#### WINE PRODUCTION.

*Annuaire International du Vin*, publié sous la direction de M. Léon DOUARCHE, directeur de l'Office International du Vin, Edition 1932, 711 p. Librairie Félix Alcan, 108 Bd. St-Germain, Paris.

[This 'International Yearbook of Wine' is a classified directory giving information regarding everything connected with the wine industry.

Part 1 is devoted to viticultural statistics and gives figures relating to the production, imports, exports, consumption and prices of wines in the different countries, covering varying periods but in most cases from before the war.

Part 2 is a compilation of all the legislative measures concerning wines and the wine trade that have come into force in the different countries of recent years.

Part 3 gives a table of the customs duties on wines in the principal consuming countries.

Part 4 gives lists of (1) vine growers' associations, (2) wine traders' associations, (3) hotel and restaurant keepers' associations and (4) other associations and official organisations throughout the world.

Part 5 contains a list of the principal vineyards in different countries. Part 6 is devoted to Fairs and Exhibitions which concern the trade.

Part 7 enumerates the periodicals dealing with vines and wines.

Part 8 gives scientific facts relating to the health-giving properties of wine and grapes.

Part 9 gives bibliographical references to the principal articles published in the vine growing and wine producing press from June 1st 1930 to August 1st 1931.

Thus the Yearbook contains all that needs to be known about wine and its production and commerce. It is to be hoped that its publication will be continued and kept up-to-date.

## FORESTRY

### The Problem of the present Crisis as affecting Forest Products and official Proposal for its Solution.

*The present situation.* — It was inevitable that forest production like all other forms of production should be seriously affected by the prevailing general economic crisis from which all the countries in the world are suffering. Its results for forestry as compared with its results for agriculture are all the more regrettable in that they imply a real danger that the present position of forest owners and also the economic resources of the States will be gravely prejudiced not merely in the immediate present but also for a long time to come.

According to LASCHTOWICZKA, the Austrian authority, the increased consumption of timber during the war was responsible in his own country for encouraging felling to an extent greatly in excess of increment. Thus an attack on forest wealth was initiated which may be said to have become a characteristic phenomenon not only in Austria but throughout the world. In vain, says HOWARD GRÖN of Denmark, has it been proved to demonstration that, by reason of the general and special interests involved in their perpetuity, forests must always be regarded from a point of view quite different from that adopted for ordinary forms of enterprise. At the same time it has been all to no purpose that the majority of the States have tried to protect their forests against the idea that they may be treated as simply commercial propositions for all the while they are increasingly becoming considered from the money value standpoint. The competition among the various countries on the world timber market, their tendency to maintain their hold on foreign markets and constantly to look for new outlets has even in some cases had the effect of tempting a Government to make inroads on its capital resources in timber with a consequential glut of forest products, excessive supply and a pricefall on the world market. Timber consumption declines as a result of the crisis while increasing distress and low prices bring about still more disastrous and wasteful forms of forest exploitation leading to a further pricefall and a continued aggravation of the crisis.

Similar symptoms are also to be found in the crisis in agriculture, but as regards forestry the present conditions are further aggravated by the special factor of the activities of the Russian Union, which possesses about a quarter of all the forest wealth in the world and is making great efforts to dominate the world market. One of the strangest features in the situation according to BAVIER (Switzerland) is the tendency for Russian timber to make headway on the North American market that is to say in countries where there is already overproduction. Thus there is

competition between one virgin forest and another, between a high dollar wage system and one of a quite different order.

SUSMEL states that in the case of Italy the costs of reafforestation and of upkeep have not been diminished but have actually increased in certain areas. On the other hand profits have been reduced to one half and even lower as compared with the profits of three or four years ago and thus a forest enterprise is no longer sound as a financial proposition. The results are very serious for forest owners and particularly for those working on a small scale for no kind of undertaking can long withstand an excess of expenditure over income. It is also clear (as ROSSEELS says, speaking for Belgium) that even if other classes of owners such as the State, the Commune, etc. may be able to wait for better times and to postpone to a later date their sales of timber for which they consider the prices at present offered inadequate, this can only rarely be the case for a private individual. As a rule in order to meet his ordinary requirements he will be compelled to abandon sound methods in harmony with social needs and to proceed to excessive and uneconomic exploitation. Although the private owner is thus driven to make inroads on his forest capital, the income he will receive from his forest will be so small, owing to the fall in prices, that he will be unable to obtain therefrom the amounts necessary for reafforestation work and up-keep, not to speak of any surplus for the conversion of his wastelands into woodlands. Thus not only is the private owner threatened with disaster but also the forests themselves. The immediate results are obviously the following : inevitable neglect of forest cultivation, increase of unemployment among persons mainly engaged on woodman's work, the sale or breaking up of large forest estates and the emigration of forest workers.

*Remedies proposed.* — Naturally in all civilised countries constantly increasing attention is being paid to the consideration of the means best adapted to prevent any further development of the present unsatisfactory state of affairs. The various remedial measures proposed in the various countries differ only in accordance with local conditions and natural environment. They may be classed under two groups : (1) Measures chiefly legislative and fiscal, i. e., of a political character, and only to a minor degree concerned with methods of cultivation, etc. ; (2) Measures which are more closely related to the perpetuation and increase of returns from forest resources in the future than to the immediate relief of the present distress of forest owners, such measures being preeminently of a technical order and having reference to methods of forest management, etc. The object of the measures proposed under the first category are mainly intended to safeguard the forestry interests of the different individual countries, whereas those of the second, which provide safeguards for the perpetual maintenance of forest resources, are of international importance.

Even though what follows will specifically relate to the first group of measures only, it should be noted that there is in reality no hard and fast distinction between the two categories which are in a certain sense complementary.

*The reduction of fiscal charges* by legislation is one of the remedies most generally demanded, such charges pressing very heavily on the forests of a very large number of countries. The incidence of these burdens, even in the past, has not, always been considered equitable and at the present time with the marked fall in price values the forests are unable to meet them. REVERTERA (Austria) states that it is a mistaken form of public economy to attempt to save the situation by high rates of taxation, thus in the meanwhile destroying the reserves of private individuals. There are even places where all the mature timber is taxed at a rate higher than the selling price it would fetch.

The land tax is generally considered to be the most unfair of the burdens that the forests have inherited from the past. According to RONAI (Austria), it is this tax that drives private owners who work their forests independently into a policy of pure and simple destruction through excessive fellings, while for other private owners working under the supervision of the public authorities, whose requirements in regard to schemes of management they must respect at any cost, a high land tax means certain ruin. In pleading for a reduction of taxes on landed property and more particularly of the land taxes falling on the smaller owners of forest lands, KJUEVER of Denmark points out that even if new assessments are made, the results will generally be inequitable for small forest owners, since as a rule forest areas are assessed jointly with agricultural or else the land tax is based on an imaginary timber growth such as the forest area might be able to carry and not on that which in fact exists.

All writers on the subject — here it will suffice to quote the names of RONAI, REVERTERA, LASCHTOWICZKA and FRANK for Austria, SUSMEL for Italy, and the contributors to the Polish Review *« Rynek Drzewni »* — are agreed in declaring that the forests can only support burdens which are based on sound economic and not purely financial considerations. In other words without causing grave risk to their continued existence, forests can only be expected to make contributions to the extent that the profits made under a proper scheme of management allow. This principle applies to succession and transfer duties and to all kinds of public charges.

RONAI calls attention to the injustice of any progressive rate of taxation for the forests according to their size. While it may be true that in the case of agriculture and industry profits increase with the size of the farm or factory not merely arithmetically but also proportionately, it is otherwise for forest estates since the average profit from any given unit of forest area is the same whether the estate be large or small. FRANK criticises many forms of new burdens, such as duties on merchantable products, on the ground that they are unfair to forestry even though they may properly be applied to other forms of cultivation. Complaints are also made in certain countries of the heavy burden of insurance and other social charges on the owners of forests. It is a remarkable and almost incredible fact that frequently, in connection with Workers' Accident Insurance, woodcraft is regarded as a more dangerous occupation than mining or those industries in which complicated types of machines are employed.

*Control of the importation* of foreign forest products is also in the countries which possess considerable forest wealth regarded as a means of improving the position of national timber producers. There is a general demand for checking the dangerous competition of foreign with native products by the imposition of import duties or by raising any existing charges. It may however well be asked whether such a form of safeguarding is really a suitable form of protection in the present general financial crisis seeing that it is a source of hindrance to trade between the various countries and is opposed to sound commercial principles while already as a result of this policy a tariff war has been started which, according to BARANSKI of Poland, is also one of the chief factors in the present aggravation of the crisis. BARANSKI considers the establishment of unrestricted trade competition and the arrangement of appropriate international trade agreements the better form of safeguarding. At the same time he is of opinion that it is necessary to check Russian dumping but in such a way that all the other countries follow the same agreed plan of campaign. As a rule however the States are only interested in protecting the production of their own particular countries, their efforts being mainly directed towards improving their respective trade balances.

D'ALVIELLA (Belgium) draws a distinction between two types of imported timber, viz., (1) foreign timbers essential for internal use for which there is no national equivalent and (2) foreign timbers which introduce an element of competition as the country itself possesses timbers which can serve the same purpose. Even though the entry of timber of the first named category is not prejudicial, there is a general demand for an effective check on the other class of timber imports. In the trade agreement made with Russia, Germany has limited closely the amount of timber which may be imported to the exact indispensable demand after the utilisation of the native product and France has made similar conditions, while SUSMEL and D'ALVIELLA on behalf of Italy and Belgium respectively claim that a like policy should be adopted. Algeria likewise calls for the protection of the native cork oak against the competition of imports from Spain and Portugal while Austria, Poland and a number of other countries consider that import dues should be raised.

DE NICOLAY warns France to consider very carefully its forestry policy, for even if a check has to be placed on Soviet imports, it is highly undesirable that this barrier should mean the holding up of important French industries.

*Improvement in transport conditions.* — While on the one hand efforts are being made by the interested countries to secure protection against foreign imports, on the other there is to be noted an equally marked tendency to obtain external markets for national products. If it may be said that there is a practically universal demand for an increase in the charges on imports, there is also a corresponding general demand for a reduction of export dues. Thus it is claimed that freight costs by sea and rail should be raised for timber coming from abroad and reduced for the native product.

*Compulsory use of native timber.* — Among the various provisions recommended for safeguarding national forest products, reference may also be made to compulsion on public administrations or State-controlled services to use a certain quota of native in preference to foreign timber (D'ALVIELLA) as also to the encouragement of private industry to adopt a similar policy.

*Propaganda in favour of increased timber production.* — According to some authorities a forestry policy specially concerned with the large scale development of the industries which utilise large quantities of timber is likely to prove one of the best of methods for relieving the crisis in forest products. Certain of them, e. g., LASCH-TOWICZKA, consider that it would be highly advantageous for forestry if the State would encourage the building of houses in wood and give permission for them to be built in the towns with exemption from taxes for a period of 30 years. He refers to German experience and is anxious that in Austria wooden hutments should be built for the accommodation of unemployed persons; in his opinion such a course would not only have a beneficial influence on timber prices but would also contribute towards the relief of unemployment. Taking the question a stage further, he believes that it would be of great practical utility to attempt to recover to a large degree the place in various industries and more particularly in architecture that timber has now lost owing to the introduction in its place of iron, steel, concrete, etc. He claims further that up to a certain point bridge building work should be restored to the timber industry. GOLDBERG (Poland) maintains that the general public should be taught to appreciate the industrial value of native timber and recommends that exhibitions and awards should be organised for this purpose. The annual meeting of the Northwest Pacific Council for Forestry Research directed that a resolution should be sent to the Department of Agriculture, where-



by the Department and also the Forestry Service were requested to issue special information to the public regarding the present timber surplus and the necessity for utilising it with due speed so as to avoid any risk of depreciation in the value of the existing forest resources.

*The Danish Forestry Association* in order to encourage the use of native wood fuel has had a wood consuming stove constructed of simple, modern and inexpensive design, which can be used in place of other forms of heating apparatus.

*Forestry Co-operative Societies* can also do much to encourage the proper appreciation and utilisation of forest products and many authorities consider that Governmental forestry policy should definitely concern itself with the promotion of this type of co-operative organisation. The State should also assist in bringing about agreements and a close collaboration between producers, middlemen and consumers or in other words a coordination of the activities of forest owners and of the timber trade on the one hand and of the timber trade and of all classes of consumers of forest products industrial or private on the other. LASCHTOWICZKA quotes as an example which may well serve as a guide to others the Swiss co-operative organisation, known as "Lignum", wherein forest exploitation and the timber trade itself are brought into close relations. In Germany the Government itself encourages the establishment of such organisations. A definite understanding exists between forest owners in Prussia and the purchasers of pit props and in Poland a compulsory syndicate has been formed between the timber merchants and forest owners. Similarly in Yugo-Slavia and Rumania timber syndicates have been set up under government influence. In such agreements and understandings a very sound principle has been introduced whereby the industrial establishment, the merchant and the producer share the risk of any loss that may result from changes in market prices occurring during the period, sometimes by no means brief, which may elapse between the date of sale and the date of delivery.

Forest owners, in common with the majority of farmers in most countries, are generally inclined to ask for *long term credit* even if restricted in character and legislative action is required to give effect to their wishes. Such credit can merely provide the basis of a number of technical and practical measures which can and should be adopted in order to assist forest workers in their efforts to overcome the crisis. The absence of such credit is an important factor to-day in the constant rise in production costs and tends to hasten the ruin of the forest owners and the decay of the forests themselves.

Never has there been a more urgent call upon the States to come to the aid of forest owners than to-day. Through their forest policies the necessary means must be found for reducing the costs of forest production even at the cost of heavy sacrifices and the most stringent economy in the public administration. It should be borne in mind that, as a rule and especially in the high mountain districts, the land that serves for the forests cannot be used for any other form of more remunerative cultivation (BRAGHETTA, Italy). It must also be clearly realised that forest production does not lend itself to any such rapid increase as is the case with ordinary field crops. The forest owner is satisfied with a more modest return, he produces for future generations and deserves therefore special consideration. The forest worker in mountain districts carries out a special duty to the Nation and in so doing makes heavy sacrifices. The States therefore must not and cannot allow these two important classes among their subjects to lapse into poverty and to abandon their office and their craft.

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As the Cameroons were not represented in the collections of the *Laboratoire d'Agro-nomie coloniale* at Paris, a scientific and practical mission was sent out in 1927-28 under the direction of M. AUGUSTE CHEVALIER for the purpose of making an inventory of the forest wealth of that country. The head of the expedition, M. LOUIS HÉDIN, gives a full account in this book.

In the operations of the Bertin Mission to the Cameroons which were carried out with great rapidity in 1917, a large number of forest trees which have at the present time a special commercial interest were passed over, and the methodical study of the forest resources of the Cameroons by botanical families, such as M. AUG. CHEVALIER undertook for the forests of the Ivory Coast and of Gabon still remained to be carried out. During the course of the expedition M. HÉDIN collected some thousand botanical specimens and 165 specimens of timber, as each time the botanical identification of a tree was made, there was taken, at the same time as the botanical specimen, a timber sample, for identification purposes in connection with the trade.

The two first chapters contain a brief survey of the composition of the forest and the present position of the forest working. Up to the present, the working has been confined to about a dozen kinds of trees, particularly mahoganies (*Khaya* and *Entandrophragma*), iroko (*Chlorophora excelsa*), ayous (*Triplochiton*), ebony (*Diospyros*), padouk (*Pterocarpus Soyauxii*) and (for railway sleepers) mangrove (*Rhizophora mangle*). In 1928 the Cameroons exported 49,952 tons of timber.

The third chapter, which forms the main part of the work, is a kind of descriptive catalogue of the kinds collected or enumeration of the kinds of trees found; notes are added on the habitat and distribution of the trees, on the character and structure of their timbers as well as various remarks on the quality and the special uses of the timber or other parts of the trees.

The fourth and last chapter formulates proposals for the improved lay out of the port of Doula, for the development of the mechanical means of working, for the extension of the working of the ordinary timbers, and of the number of the saw-mills, for forest conservation and the formation of a large number of forestry reserves.

The clear explanations given, the simple and practical arrangement of the subject matter, and the excellent alphabetical list of the scientific and vernacular names render the book easy to consult. It contains also a bibliography, a map and 14 illustrations, mainly views and herbarium specimens.

R. W

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# MONTHLY BULLETIN

## OF

### AGRICULTURAL SCIENCE AND PRACTICE

1932

No. 3

#### GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

##### Miscellanea

##### I. GENERAL AGRONOMY.

##### Meteorology.

METEOROLOGICAL ANOMALIES OF THE AGRICULTURAL YEAR 1930-1931 IN FRANCE. — According to J. SANSON (*La Vie agricole et rurale*, Paris 1931, No. 47, p. 325-327) except in south-eastern France there was a markedly abnormal quantity of rain (a metre or over) and a deficit in the hours of insolation, particularly in the north of the country. This explains the results of the last agricultural season which were in many cases deceptive.

The south-eastern region on the other hand had less rainfall and a greater number of hours of insolation than in 1929-1930.

RELATIONSHIP BETWEEN MALARIA AND METEOROLOGICAL FACTORS IN ARGENTINA. — The Director of the "Malaria and Endemic Diseases" Section of the Department of Public Health of Argentina has collected and published in the *Prensa Médica Argentina* of 30 April 1931, a number of data concerning the outbreaks of malaria, the mean temperature, rainfall and insolation in various localities.

According to the *Rivista di Malariologia* for May-June 1931 these data show an epidemic rhythm of about 5 years, coinciding with the maximum rainfall and high temperatures. There is also an intensified outbreak of malaria corresponding with a minimum of sunspots recurring about every 11 years. It is thought that these facts will make it possible to predict several years in advance serious epidemics of this troublesome disease.

FORECASTING HAILSTORMS IN HUNGARY. — At the 17th assembly of the German Meteorological Society (Vienna, 1931) M. AUJESZKY communicated the first results of his research on forecasting hail.

The lack of information regarding hail in weather forecasts is usually excused by saying that hail being a local phenomenon cannot be predicted with certainty, but M. AUJESZKY holds that the possibility or impossibility of hailstorms can be predicted as well as other storms.

As a result of his research based on the work of WEGENER, BERGERON, REFSDAL and RANTHJEN he considers that it is right to regard all rain storms as composed of melted hail. He has attempted to explain the formation of hail and has successfully predicted hailstorms in Hungary. His chief results up to the present are as follows:—

(1) Hail is formed exclusively in air currents in the warm season, but may exceptionally be formed in cold currents when the humidity of the air varies greatly and there is a gradual upward passage.

(2) The moment of a fall of hail may be predicted even 24 hours in advance.

(3) The exact locality in which the hail will fall cannot be foreseen. Districts crossed by air currents during the warm season are the most liable to hail. Accurate determination of the rate of the currents will provide indications on the subject.

(4) In 1931 16 hailstorms were accurately predicted. In 8 cases possible but not probable hail was announced and no hail was reported by the 75 observation posts in Hungary. In one case in which the same prediction was made, hail fell. There was a single case of a hailstorm when none was predicted. (*Meteorologische Zeitschrift*, Braunschweig 1931, Heft 12, p. 484-485).

T. B.

## Soil Science.

DIALYSIS OF COLLOIDAL CLAYS. — M. L. SMOLIK of the Agricultural Experiment Station of Brno, Czechoslovakia, dialysed 3 colloidal clays obtained by ultra-filtration of clay suspensions and obtained the following results.

All the substances absorbed by the colloidal clay passed through the dialyser membrane, but in very divergent proportions: —  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  and  $\text{Fe}_2\text{O}_3$  in very small quantities, the bases in large proportions, as seen in the following table.

	%		%
$\text{SiO}_2$ . . . . .	0.0024 to 0.0048	$\text{MnO}$ . . . . .	5.88 to 25.05
$\text{Al}_2\text{O}_3 - \text{Fe}_2\text{O}_3$ . . . . .	0.0087 to 0.0120	$\text{MgO}$ . . . . .	16.19 to 36.00
$\text{TiO}_2$ . . . . .	3.00 to 19.96	$\text{CaO}$ . . . . .	90.00 to 98.00
		$\text{K}_2\text{O}$ . . . . .	33.70 to 52.02
		$\text{Na}_2\text{O}$ . . . . .	97.57 to 99.00

(*Věstník Československé Akademie Zemědělské* (Bulletin of the Czechoslovakian Academy of Agriculture), Praha 1932, Ročník VIII, Číslo 1, p. 19-22).

THE USE OF SODIUM HYPOBROMITE FOR THE OXIDATION OF ORGANIC MATTER IN THE MECHANICAL ANALYSIS OF SOILS. — The use of hydrogen peroxide in boiling solution proposed by G. W. ROBINSON for the oxidation of the organic matter has the drawbacks that  $\text{H}_2\text{O}_2$  is an expensive and troublesome reagent in the tropics and that in certain soils the peroxide is decomposed so rapidly by catalysis by manganese dioxide that it is almost impossible to complete the oxidation of organic matter. To overcome these difficulties ERIC TROML (Rothamsted Experimental Station) proposes the use of a cold solution of sodium hypobromite, which is obtained by adding 2.5 % in volume of bromine to a normal solution of caustic soda.

The use of freshly prepared  $\text{NaBrO}$  solutions instead of boiling  $\text{H}_2\text{O}_2$  solutions has the following advantages:—

- (1) The reagent is cheaper and more stable, especially in the tropics.
- (2) Soils containing manganese dioxide or large amounts of organic matter may be oxidised rapidly without heat, whereas oxidation of such soils by  $\text{H}_2\text{O}_2$  is a tedious operation requiring large amounts of reagent.
- (3) Possible changes in the clay through heating and the dissolution of considerable amounts of sesquioxides are avoided.
- (4) Acid treatment and the addition of a special deflocculating agent are unnecessary, owing to the more effective dispersion of the sodium clay used. (*Journal of Agricultural Science*, London 1931, Vol. XXI, Part 3, pp. 476-483).

MICROBIOLOGICAL RESEARCH ON CERTAIN FEN SOILS IN ITALY. — Mention was made of previous studies by O. VERONA (Agricultural Institute of Pisa) on some soils of the Pisan Campagna in this *Bulletin* in 1930 (No. 11, p. 406). His investigations have with the help of two collaborators been extended to certain soils of the wooded fenland (*Maremma*) in the province of Grosseto, to the south of Massa Marittima and in the vicinity of Talamone. The following is a summary of the main results obtained.

*Soils from the district of Massa* (O. VERONA and E. BAJ). — The greatest microbiological content is found in autumn and spring and is composed mainly of bacteria, all of which are ubiquitous.

The biochemical activity of the bacteria is satisfactory but shows seasonal variations.

Fixation of atmospheric nitrogen is maximum in autumn, minimum in winter.

Ammonification is maximum in autumn and winter, minimum in spring and summer.

Nitrification is maximum in spring and autumn, minimum in winter and summer.

Denitrification is slow in autumn, does not occur in winter and is rapid in spring.

*Soils from the maremma of Talamone* (O. VERONA and S. PACI). — The microbiological content varies with the seasons, being maximum in summer and low during the rest of the year.

Bacteria are the predominating forms, but there are also a number of fungi. The species so far isolated are all ubiquitous and known.

The intensity of nitrogen fixation, which is practically equal in the various soil



types, is maximum in autumn and differs little in the other seasons; it is on the whole satisfactory for soils with an acid tendency such as those studied.

Ammonification is adequate for plant requirements and shows no marked differences from one soil to another but varies greatly with the seasons, being maximum in autumn, less in summer and markedly low in winter and spring.

Nitrification is nearly equal and is minimum in all soils in summer; maximum in autumn.

Denitrification is nearly equal in all the soils studied, being nil in summer, increasing in autumn and diminishing again in winter.

The soil microbiological studies so far carried out by the Pisa Agricultural Institute cover the Roman Campagna, the Talamone plain, the Grosseto maremma, the Cecina maremma, the Pisan Campagna and the district of Massa Marittima. (O. VERONA e E. BAJ, Batteriologia di alcuni terreni del Massetano, in *Bollettino del R. Istituto Superiore Agrario di Pisa*, Anno 1931, Vol. VII, N. 44 — O. VERONA e S. PACI, Contributi alla batteriologia dei terreni della Maremma di Talamone. *Ibid.*, Vol. VII, N. 46).

T. B.

### Fertilisers and Fertilising.

CHANGES IN COMPOSITION OF SOYBEANS TOWARD MATURITY AS RELATED TO THEIR USE AS GREEN MANURE. — A chemical study of the organic composition of the tops and roots of the soybean plant with increasing maturity carried out by ALBRECHT and ALLISON at the University of Missouri has shown that the efficacy of the plant as green nitrogenous manure varies according to its age. The chief results obtained were as follows:—

The percentage of total nitrogen decreased with the age of the plant. In the roots it was only in the earliest part of the season that it reached 1.70, the figure considered by WAKSMAN as the minimum at which decomposition with nitrogen liberation occurs.

The water-soluble constituents decreased in both roots and tops as the plant became older. Less than 30 % of the total nitrogen was water soluble, or in the form considered by some as readily nitrifiable.

The alkali-soluble material, considered slowly decomposable, increased markedly toward plant maturity and the nitrogen content of this portion decreased, especially in the alkali-soluble lignin.

The carbonaceous material, including the reducing sugars, the cellulose, and the pentosans, all decomposable by soil microorganisms in the presence of soluble nitrogen, increased with maturity of the plant.

In consequence of the increase of carbonaceous matter and the decrease in total nitrogen there was a widening carbon-nitrogen ratio.

The percentage of total lignin, decomposable only slowly, increased over 100 % in 3 months of growth. In the tops this increased from less than 12 % to almost 24 %, and in the roots it mounted from about 9 % to almost 23 % in this time. The pentosan-lignin ratio was a narrow one, which might indicate slow decomposition, especially of the soybean roots.

These results indicate that the percentage of more readily soluble nitrogen in the soybean crop, including both tops and roots but especially roots, decreases as the plants grow older, whereas that of the carbonaceous matter usable by microorganisms mounts so rapidly that, as a green manure, the more mature crop is a bacterial ration with excess of carbonaceous matter and such deficiency of readily soluble nitrogen that its decomposition may jeopardize the soil's supply of available nitrogen for other crops. This may explain the depressing effect soybeans are often found to exercise on the following crop.

There is need for fuller chemical knowledge of the changes of the organic complexes of the plant as it becomes more mature, and for a fuller knowledge of the decay of these complexes within the soil, so that chemical studies of green manures may more wisely guide their use for maximum effective nitrogen liberation in the soil. (*Soil Science*, Baltimore 1931, Vol. XXXII, No. 4, pp. 271-282).

FERTILISER TRIALS WITH LEUCITE IN ITALY. — From 1926 to 1929 the Agricultural Chemistry Experimental Station at Rome carried out comparative trials of the effects of ground leucite and potassium chloride on various soils in which the NEUBAUER biological test had shown a potash deficiency. The leucite was applied in varying amounts, but the dressings were heavier than those usually given of soluble potassic fertilisers, and so provided supplies for several successive crops. The crop rotation was that usually following in Central and South Italy, namely:— maize, wheat, lucerne, beans, sainfoin, potato. The following results are of interest.

I. *The experimental field of the Station, soil calcareous, sub-alkaline.* (1) *Maize*. — Leucite applied at a rate of 10 quintals per ha. gave good results, but inferior to those given by potassium applied at a rate of 1.5 quintal.

(2) *Wheat*. — During 2 consecutive years under wheat a dressing of 10 quintals per ha. was applied. This was without effect both when wheat followed maize and when wheat followed wheat. The application of potassium chloride was however also ineffective.

(3) *Lucerne*. — Leucite applied at a rate of 20 quintals per ha. as a 3 years' supply was effective from the first year, in which the 3rd crop showed a gain nearly equal to that given by KCl. In the second year the 1st crop even exceeded that given by KCl. In the third year however the effects of the leucite were scarcely appreciable.

II. *The Aniene experimental farm, soil calcareous loam.* (1) *Beans*. — For 2 years of consecutive culture 20 quintals per ha. of leucite were applied. In the series with supplementary phosphate dressing the effects were nearly equal to those with KCl in the first year, and were slightly superior the second year. In the series without phosphate the leucite produced no effect either year.

(2) *Wheat after beans*. — In the series without the addition of superphosphate the straw yield was greater with leucite than with KCl, which was possibly due to a specific action of the silica in the leucite in the presence of a low proportion of available  $P_2O_5$ . In the series with superphosphate the yield of straw and grain was rather less than with KCl.

(3) *Sainfoin*. — In the second year the gain in yields was approximately equal with leucite and KCl, both supplemented by superphosphate.

III. *Rocca Priora experimental field (Castelli Romani), soil volcanic, sour, rich in humus.* (1) *Maize*. — Leucite applied at a rate of 10 quintals per ha. increased the yield slightly less than KCl.

(2) *Potatoes*. — A similar dressing of leucite gave better results than the KCl.

*General conclusions.* — In soils requiring potash leucite can have an action on crop production comparable to that given by KCl if it is applied in heavier dressings than would be applied of a soluble potash fertiliser.

The crops most benefited by the application of leucite are the legumes. For wheat it is better to apply the leucite to the preceding crop, particularly if it is leguminous, because the legumes tend to favour the process of solubilisation of the leucite potash.

The fertilising action of leucite is in the first year generally inferior to that of KCl, but in the second it may be equal or even superior.

In Central and Southern Italy where the climate is warm and dry and it is desirable to avoid as far as possible increasing the concentration of the salt solution in the soil the use of leucite is found more beneficial than that of the soluble potash salts.

Its use is recommendable for periodic fertilisation in order to increase soil productivity for a succession of crops. (TOMMASI G. e DOJMI S., *Esperienze di concimazione con leucite, Annali della R. Stazione chimico-agraria sperimentale di Roma*, 1931, Serie II, Vol. XII).

T. B.

## II. — CROPS OF TEMPERATE REGIONS.

LUCERNE SEED PRODUCTION STUDIES IN MICHIGAN, U. S. A. — Lucerne is known to possess a mechanism for the explosive dispersal of its pollen. When the edges of the keel are spread apart the staminal tube is released and both the pistil and stamens snap up against the standard. The pollen is scattered in this process, which is called "tripping". The flowers are usually tripped by visiting insects.

An experiment was begun by DOWN in 1928 to study the influence of artificial tripping upon lucerne seed production under Michigan conditions. The experiment was enlarged in 1929 to include the influences of such atmospheric factors as temperature and relative humidity upon pod and seed production.

In 1928 45.1 % of the flowers artificially tripped produced pods, while 15.8 % of those allowed to develop normally set pods. The pods from flowers artificially tripped and those from flowers allowed to develop normally contained 1.53 and 1.78 seeds per pod respectively. At mid-day a greater percentage of the flowers produced pods than at either 9 or 5 o'clock, indicating that conditions are more favourable at that time to tripping and to those processes influencing the setting of pods.

In 1929 56.1 % of the flowers artificially tripped produced seed pods, while 12.2 % of those allowed to develop normally set pods. The average number of seeds per pod

was 2.35 for the artificially tripped flowers and 1.99 for those allowed to develop normally.

Pod production by the artificially tripped flowers varied materially according to the time of day when the flowers were tripped. On the average the percentage of pods increased as the day advanced until 11 o' clock, decreased until 3 o' clock, and then increased again.

Attempts to correlate atmospheric factors such as temperature and relative humidity with the setting of pods failed to show any marked relationships. The consistent negative trend of the correlation values obtained, however, between relative humidity and pod production tends to indicate that as this factor decreases conditions become more favourable to those conditions favouring tripping and the setting of pods.

Thus the data obtained prove that lack of tripping was one of the chief factors limiting lucerne seed production in Michigan during 1928-29. (*Journal of the American Society of Agronomy*, Vol. 23, No. 12, 1931)

D. K.

REGENERATIVE CAPACITIES OF LEAF AND LEAFLET CUTTINGS OF TOMATO AND OF LEAF AND SHOOT CUTTINGS OF POTATO. — It is well known that the tomato plant is easily regenerated by stem cuttings but reference to the literature failed to reveal any work on the regenerative power of leaf and leaflet cuttings. An investigation was made by ISBELI, during 1928 and 1929 to determine the regenerative capacities of leaf and leaflet cuttings of the tomato, and of stem and leaf cuttings of the potato.

Leaf cuttings of the tomato regenerated roots and shoots from the petioles, and shoots in the axils of the leaflets. Some specimens produced flowers and fruits. Leaflet cuttings regenerated roots but had not differentiated shoots when the experiment was discontinued.

Stem cuttings of the potato converted one of the axillary buds into a tuber, tuber and roots, or a tuber in combination with a shoot and roots. Some produced roots directly from the base of the cutting. Potato leaf cuttings with axillary buds converted the axillary bud into either a shoot or a tuber. (*Botanical Gazette*, Vol. XCII, No. 2, 1931).

D. K.

FRUIT GROWING IN THE U. S. S. R. — An interesting report has been received from the Central Experiment Institute for Fruit Culture at Kozlow. Previous to the Revolution little attention was paid to fruit growing in Russia; only about 100,000 hectares were under orchards and the annual yield per head was as low as 10 to 15 kg. The Government then undertook a scheme by which a further 6 million hectares of orchards should be planted by 1937 and the annual production raised to 150-200 kg per head. Two central institutes for experimental fruit culture were opened by the Lenin Academy of Agricultural Science in co-operation with the Peoples' Commissariat of Agriculture. Under these central institutes are subsidiary stations in the different fruit-growing districts which carry out the planting of orchards.

The Central Institute for Southern Fruit Culture is situated at Kiev. Regional stations are already working in the Crimea, Ukraine, Caucasus, Azerbaijan and other parts of the country which are favourably situated as regards climate and soil.

In the northern region of the country the long winter and severe cold (reaching  $-40^{\circ}\text{C}$ ) had made fruit growing too difficult to be of any importance until MITSCHURIN, who has been called the "Burbank of Russia", started his cross-breeding and selection work. By crossing the small but prolific frost-resistant fruits of Siberia with the large southern fruits he produced valuable varieties of fruits which have made it possible to extend the cultivation of apples, pears, grapes, apricots, almonds, peaches, etc. into parts of the country which have not before produced fruits. These northern fruit plantations successfully withstood the severe winter of 1928-29.

MITSCHURIN's fruits were known in America before the war and are spreading in the northern United States and in Canada, but it is only since the Soviet Government came into power that their economic value has been recognised in Russia.

The "Central Institute for Northern Fruit Culture" has been established at Kozlow in the black-soil district. There is a large staff of specialists, a fruit culture library with 50,000 volumes and a section for documentation of international scientific literature. Regional stations have been opened at Moscow, Leningrad, Saratow, Nowgorod, Samara, Kazan, Nowosibirsk and Minusinsk.

In the autumn of 1931 the proposed planting of a minimum of 16 million new trees was exceeded by 25%. In the summer of 1931 50 million seedling plants were budded

in the nurseries, and a further 100 million seedlings are to be planted by this spring in the Institute's nurseries.

To help in the carrying out of these large scale plans an institute for the mechanisation of fruit culture has been established at Moscow. All kinds of imported modern machinery and implements are in use. All planting is done by machinery. The construction of grafting machines and harvesting machines is not yet completed.

By centralisation and careful control of horticultural schools the quality of the mother plants for propagation are guaranteed. And by co-operation between the Institute of Fruit Culture and the technical schools a large number of trained fruit growers are available for the collective fruit farms

A. M. F.

**ROOTSTOCK INFLUENCE ON THE APPLF.** — A recent paper by HATTON, the Director of the East Malling Research Station at which has been carried out the greater part of the work on rootstock influence described in an earlier number of this *Bulletin* (1930, No. 5, pp. 157-161), gives further proofs of the practical value to fruit growers of a knowledge of the potentialities of the stock upon which their trees are grafted. The following table, which is based upon the performance of trees planted equidistant, shows in a striking manner the difference in profits that might be obtained during the first 11 years from two orchards, one worked on a vigorous rootstock and one on a dwarfing stock. The suitable distances at which to plant the two types are also given, as calculated from the average height and spread of the trees.

Variety	Stock	Distance in feet	Number of trees per acre	Total production of 11 years, in bushels per acre
Bramley's Seedling . . . . .	Dwarfing (Malling IX) . . . . .	12	302	3,020
	Very vigorous (Malling XII) . . . . .	36	33	288
Lane's Prince Albert . . . . .	Dwarfing (Malling IX) . . . . .	10	435	2,232
	Very vigorous (Malling XII) . . . . .	24	75	382
Worcester Pearmain . . . . .	Dwarfing (Malling IX) . . . . .	10	435	1,718
	Very vigorous (Malling XII) . . . . .	20	109	414

Apart from its effects on size of trees and early yield the rootstock has been shown, after 12 years' observation of 2000 trees of a considerable number of varieties and upon 5 different soils, to influence questions of nutrition, disease resistance and storage quality.

Further experiments are recorded which seem to show, in opposition to what had previously been thought, that in this influence the root of the stock plays at least as great a part as the stem portion. (*Journal of Pomology and Horticultural Science*, London 1931, Vol. IX, No. 4).

A. M. F.

## TROPICAL AND SUBTROPICAL AGRICULTURE

### Date palm growing in Southern Algeria.

**INTRODUCTION.** — A « Date Palm Week » organised under the patronage of the Governor General of Algeria by the Algerian State Railways in collaboration with the Government Departments of Agriculture and the Southern Territories, took place at Biskra from 5 to 12 November 1931. A number of interesting reports on the cultivation of the date palm in Southern Algeria were read and in view of the fact that the date has become one of the most important North African crops a summary of these reports is given below.

**GENERAL CONSIDERATIONS.** — An Arab proverb says that the date palm wants "its feet in water and its head in the fire". This would appear to indicate that it is particularly exacting in regard to climate, but the date is found growing in some-

what diverse regions, which shows that in reality it is able to accommodate itself to a considerable range in climate. The two essentials for it to flourish are, in addition to an abundant water supply, sunshine and warmth. These two necessities are closely associated in the Sahara. The lowest mean annual temperature which will ensure a good growth of the date palm is about 17.5°C. This minimum is found at Laghouat. This mean temperature must be associated with a high summer temperature and great clearness of atmosphere. The date palm will grow near the sea only if the atmosphere is sufficiently pure and dry so as not to interfere with an adequate total insolation.

Years in which the temperature is nearest to the normal are most favourable. Cold and accompanying rain jeopardise the crop when they occur in the flowering and ripening seasons. When the season is hot with predominating southerly winds ripening is early and is usually followed by drying out.

**VARIETIES.** — The varieties of date palm met with in Southern Algeria present very marked differences as regards appearance and commercial value. A natural selection seems to have acted for the various varieties are well adapted to the conditions of their environment. The commonest varieties growing in oases in Algeria are the “*Deglet-nour*”, the “*Degla-Beïda*” and the “*Ghars*” or “*Rhars*”.

*The Deglet-Nour.* — This variety is the most highly valued for the export trade, which it supplies almost entirely. It is a late variety, varying in quality from year to year according to the season. The palm has a slender trunk and light foliage. It is exacting as regards soil, rainfall and cultural treatment.

There are at present about 600,000 palms of this variety in cultivation; they are all in the oases of the French Sahara. They are grown particularly in the territory of Touggourt (Ziban, Oued-Rhir and Souf) and of recent years in the region of Ouargla.

*The Degla-Beïda.* — The palms of this variety are hardy and vigorous; they are particularly resistant to saline soil. The fruit, unlike that of the *Deglet-Nour*, is hard and dry and rich in sugar and starch. They are easily preserved. The centre of production of *Degla-Beïda* dates is the district of Oued-Rhir.

*The Ghars.* — This variety is early and very hardy; it has a luxuriant foliage and a well-developed trunk. *Ghars* dates are soft and belong to the “honey” type. The variety is grown mainly in the district to the south of Constantine.

**RATIONAL MANAGEMENT OF A DATE PALM PLANTATION.** — As with other crops the main objective is to obtain the product with the least possible cost. This is attained by giving the palm optimum conditions for growth, that is by giving it suitable soil with a good mellow tilth, supplying any lack of fertilising elements and giving the necessary water at the moment when it is required.

(1) *Tillage.* — The soil must be broken up not only on the surface but to a good depth to allow easy penetration of air and an unobstructed development of the roots.

As soon as the crop is harvested, at the beginning of November, the ground is deeply ploughed to aerate the soil and remove weeds. In certain heavy soils subsoiling is also advisable and can be satisfactorily effected by the use of nitrogenous explosive; care must be taken to avoid chlorate explosives as these are toxic to plants. A second deep ploughing is carried out early in spring in and between the rows.

Hoeing at frequent intervals is also recommendable to prevent the soil from caking and to check the loss of chlorides.

The physical improvement of the soil has also the advantage of allowing a bet-

ter utilisation of rain and irrigation water and making any rainfall immediately efficacious. Tillage operations must thus always precede irrigation.

(2) *Fertilising*. — Oasis soils are in general deficient in fertilising elements and a practical method of supplying them must be sought.

Stable manure being very scarce, green manure or chemicals or more often both must be used.

Trials of chemical fertilisers in the oases have in general given satisfactory results. If the soil is not saline the use of chemicals is much simplified, for all fertilisers are then practicable. Green manure can be obtained in abundance by growing such leguminous crops as white lupin, fenugreek, lucerne or Alexandria clover. These plants grow vigorously provided that they are supplied with the necessary foods: nitrogen, phosphoric acid and potash. They will supplant stable manure as they provide humus and also fix atmospheric nitrogen. Alexandria clover must be sown at the end of September or the beginning of October; the first three crops are cut and the next dug in while in flower. Lucerne is particularly suitable by reason of its high yield; there is a special salt-resistant variety called Temacine lucerne. Lucerne is kept for four or five years on the ground.

The cut green fodder is used as a feed for small stock or the few hardy cattle that are kept to supply a little manure to complete the production of humiferous substances.

Calcium is seldom deficient in the oasis. The other elements that are lacking may be supplied in the form of one of the standard complete fertilisers with a basis of superphosphate, potassium chloride and ammonium sulphate. The "Service Agricole des Territoires du Sud" has carried out tests at its experimental stations at Aïn-Ben-Noui and El-Arfiane with various complete fertilisers, namely:—

(1) 'Degla-double', which contains 6 % ammoniacal nitrogen, 14 % soluble phosphoric acid and 13 % soluble potash.

(2) 'Trois-six', which gives good results particularly with young plantations; with old palms its action is not so well marked. It contains 6 % total nitrogen, of which 2 % is organic, 2 % ammoniacal and 2 % nitric, 6 % soluble phosphoric acid and 6 % potassium sulphate.

(3) 'Rationnel', which has been tested in the same conditions as the last and has consistently given good results. It contains 8.5 % total nitrogen, of which 4.5 % is ammoniacal, and 4 % nitric, 10.5 % phosphoric acid of the double superphosphate and 9.75 % potassium sulphate.

(4) 'Trois-neuf', which is of the same type as the 'Trois-six'. It contains 9 % total nitrogen, of which 4.5 % is ammoniacal and 4.5 % nitric, 9 % soluble phosphoric acid and 9 % potassium sulphate.

Another fertiliser of the same type but still richer, the 'Trois-douze', has been tested and found well suited to the conditions of the central and southern Sahara.

(5) 'The 5.7.10', which is intended for soils not yet entirely freed from salt. It contains 5 % soluble phosphoric acid, 7 % nitric nitrogen and 10 % potassium sulphate.

A series of fertilisers prepared by the "Société Potasse et Engrais chimiques" of Paris is also under trial.

Fertilisers must be spread over the whole of the irrigable surface after rain and must be lightly hoed in to prevent loss of nutritive elements. Three applications can be made:— one after the crop has been picked to enable the palm to recover its strength, a second when the new inflorescences make their appearance and the third at the end of June to feed the developing fruit.

*Fertilising of saline ground* is a difficult problem. It has been carefully studied,

for it is just in the salty land that most water is available. The date palm yields a satisfactory crop only if the salinity of the soil is below 1 %. If small quantities of manure are available it can be laid along the rows of trees for it is the best antidote to marine salt. Manure also prevents desiccation and the consequent loss of chlorides. It is in any case advisable to remove as much as possible of the salt to make it possible to grow other useful crops. While the soil remains saline the chloride content should not be increased by fertilisers, but the potash should be applied in the form of sulphate; nitrogen should moreover be applied in a directly available form such as the nitrate of sodium or calcium, for the ammoniacal, nitrous and nitric ferments are practically inactive in a salt soil.

The difficulty of removing salt from the ground is ordinarily increased by the available water being more or less saline. The most rapid method is by abundant leaching. The leaching water is run off into a system of drains consisting of a smaller number of large channels following the greatest slope of the land and a greater number of small channels running across the slope and opening into the main drains. A method of hastening the process is to remove periodically the saline deposit which forms on the surface of the soil. As soon as the ground is fit for cultivation various crops should be planted, particularly legumes for green manure.

(3) *Irrigation and Drainage*. — The amount of water that must be supplied to a date palm plantation to get good growth varies very much in different soils and districts. The necessary volume of water depends both on the physical nature of the soil, its power of imbibition, and on its chemical composition. As has been mentioned above the better the tilth and the lower the salt content the less water is required. Another factor is the age of the tree. The average requirement in the oases of Southern Algeria is 1 litre of water per minute for 3 date palms. This supply is obtained in different ways in different plantations.

There can be distinguished, on the lines followed by M. MOULIAS in his work on "The hydraulic organisation of the Sahara oases", oases which utilise mainly surface water, with constant and variable flow — artesian oases — oases without flowing or jetting water — oases with "foggaras".

The oases belonging to the first type with a constant flow of water are situated in the vicinity of Biskra, in the Zab Dahraoui and the Zab Guebli. The water supplies are completed by means of artesian and other wells. The oases of the type with a variable flow of water are situated on the southern slopes of the Atlas mountains in the Sahara and utilise the stream water. The artesian oases are those of the Zab Dahraoui, the Oued-Rhir and the regions of Ouargla and El-Goléa.

In the oases having no flowing or artesian water the necessary supplies are provided by means of ordinary wells or, if the water bed is not too deep, the palms can reach it with their roots.

In the "foggaras" oases water is caught in subterranean channels or "foggaras" at the level of the artesian water. The management of the "foggaras" is a difficult and skilled work.

As the date palm is not tolerant of stagnant water any accumulation of surplus water from irrigation or leaching must be carried away. The drainage system is as complicated as that of irrigation; it consists of dykes carrying the water into "chotts" or salt lakes. To prevent these stagnant pools from being a danger to health the administration has in certain districts dug a canal which receives the water from all the dykes and itself acts as a "chott".

There is summer and winter irrigation. The former is effected when the dates are developing, that is from June to August. Each tree must be watered at least once a week. In September and October watering is also necessary but in lesser

amounts. In winter irrigation is restricted to keeping the soil moist, so as to avoid too great leaching of the fertilising elements. During the coldest months watering has the advantage of warming the ground and re-initiating growth.

When the supply of irrigation water is limited and the soil is clayey the palms are watered by means of holes hollowed out a certain distance from the foot. When the water supply is relatively abundant and the soil is saline irrigation is effected by means of flood basins; the whole plantation is thus banked up with soil into a number of compartments. When young palms or "djebars" are to be watered a basin is merely hollowed out at the foot and filled with water; more frequent waterings are required with this system. If the plantation is on a hillside a basin is dug out above the foot of each palm.

**ASSOCIATED CROPS.** — In the palm plantations ground crops are of considerable importance. The rôle of green manures will not be discussed again here, but the subsidiary crops will be considered from other aspects.

Such crops are to be recommended as supplying some of the natives' necessities, as helping to check the growth of weeds, as supplying the fresh vegetables and fruits which make the region so much more habitable for Europeans and as making it possible to keep a certain number of stock.

Their cultivation requires method, for the shade of the palms is unfavourable to most plants. It is essential when laying out a new plantation to leave adequate space between the palms for the aeration of underlying crops. Among these may be grown fruit trees, vegetables and fodder plants.

(1) *Fruit trees.* — With the exception of the citrus species fruit trees are not well adapted to growth in a palm plantation. Apricots, peaches, plums and figs can be grown on the edges of the plantation or in separate orchards. Other fruits are not of any importance.

The cultivation of citrus fruits seems particularly indicated in the southern oases. The orange, and specially the Biskra blood orange, adapts itself very well to growing under the palms. The other species, such as the mandarin orange, the lemon, the citron and the grapefruit all succeed well in the oases. Trials are being made of the "pomelos", a hybrid of the grapefruit.

(2) *Vegetables.* — Vegetables are best in new plantations in which the young palms benefit from the cultivation given to the subsidiary crop. Vegetables can be grown in alternation with green manure crops. Those which can be cultivated are all the cruciferous vegetables, certain legumes, tomatoes and eggplants, salads and the Cucurbitaceae (on saline soil). These crops are grown mainly for consumption on the spot.

(3) *Fodder crops.* — These are mainly for green manure and in smaller quantities for stock feeding. The best fodder is given by Temacine lucerne which ensures a supply of fresh feed during the summer. Alexandria clover is also successful and produces as much as 20 tons to the hectare.

As an associated and catch crop cotton is now being tested in the new palm plantation of the Oued-Rhir. The success of the cotton crop is dependent on the fertilisation of the soil, the formation of shelter against the sudden changes of temperature and violent winds and on the choice of varieties resistant to saline soils. Experiments are now being carried out at the Experiment Station of El-Arfiane.

**POLLINATION OF DATE PALMS.** — The crop naturally depends on successful pollination. The date is in flower from February to the end of May; in general the last inflorescences are not pollinated. The choice of pollen is of great importance.



In order to be sure of a supply of pollen when it is required it is advisable to keep some from one year to the next, though fresh pollen is preferable. The pollen must be used to pollinate palms as nearly as possible of the type of the male tree ("dok-har") from which it was taken. The operation must be done on a warm, calm day or the dates will be stoneless and of no commercial value.

**THINNING OF BUNCHES.** — Limiting the bunches is a useful practice for the regular production of good quality dates; and prevents also a too great exhaustion of the palm. Thinning is carried out as soon as the fruit is set, that is at the end of May or beginning of June. The bunches at the heart which take too much sap from the palm and late bunches are removed and sometimes also others in order to balance the tree. In general the number of bunches should be between 3 and 12 at most, according to the vigour of the tree.

**OTHER PRACTICES.** — When the bunches have nearly reached full size each one is attached to a palm frond for support.

Experiments are now in course at the Experiment Station of Aïn-ben-Noui to determine whether regular ripening can be obtained by surrounding the bunches with cellophane bags of different colours.

During winter the plantation is tidied up by the removal of dead or broken foliage and the greedy feeders are grubbed. In the spring the "djabars" which will be useful for planting are detached.

**FORMING A NEW PALM PLANTATION.** — A site for a new date plantation should be chosen after careful prospecting for suitable soil. The choice of a site depends also on the distribution of irrigation water. This last problem may be solved by attention to the slope of the land. The position of future irrigation and drainage channels must be studied, keeping the line of the greatest slope for the main drain, and staking out with care the course of the smaller channels. Next the holes for planting are prepared. Formerly they were dug out by hand, but this method was found in some soils to pack the sides of the hole into a wall not readily penetrable by the roots and now explosives are preferred for the work. The holes are made 9 × 9 metres; the young palms are not planted more closely in order to allow of the growing of ground crops. Planting takes place from April onwards. There should be careful selection of varieties. The female palms are propagated by djabars which exactly reproduce the characteristics of the parent tree. Djabars should weigh from 10 to 15 kilos (a djebar weighs about 1 kg. per centimetre of diameter). The best time for removing the djabars is between March and May. Great care is required in detaching the djebar from the parent palm because the heart is fragile and serious shaking or other cause of disturbance must be avoided or there will be a high rate of mortality. Before the djabars are detached they must be cut back; this is done with varying degrees of severity. It is advisable also to disinfect the djabars before planting; fumigation is a better method than spraying as it is more likely to reach scale insects. After planting watering must be carefully attended to.

The male palms are propagated entirely by seed. Among the seedlings will be found a certain number of females and of males not suitable for pollinating which must be culled.

Date palms are capable of a normal production for only between 12 and 15 years and great prudence must be exercised in the first crops.

**DISEASES AND PESTS OF THE DATE PALM.** — *A. Diseases.* The "white" disease, called "Baioudh" by the natives, is the most serious of the affections of the date

palm. It is highly contagious and occurs chiefly in the oases of south-eastern Morocco and south-western Algeria. The causes are not yet fully known, but eminent pathologists regard it as due to a fungus, *Cylindrophora albedinis*. The curative treatments tried up to the present do not seem to have given positive results and control is thus entirely by preventive treatment.

The "inflorescence rot" "called" khamedj" by the natives occurs everywhere in the North African oases. It is not highly contagious and is attributed to the fungus *Manginella Scaetiae*.

Control consists in careful watching of the plantation so as to remove promptly any affected bunches and spraying with lime-sulphur shortly before the appearance of the inflorescences.

B. *Insect pests*. — *Paratetranychus heteronychus* Ewing, a mite of a yellow or greenish colour, causes an affection known as "Bou-Faroua". The mite is enabled to spread on account of the dry state of the atmosphere. The best means of control consists in the use of flowers of sulphur mixed with chalk or plaster. The efficacy of powder extracts of pyrethrum, nicotine and derris root is now being tested. This affection develops mainly in the regions of the Oued-Rhir, the Zab Cherghi and the Zibans.

The two scales *Parlatoria blanchardii* and *Phoenicoccus marlatti* are frequent parasites of the date palm in all the oases of the eastern Sahara and the region south of Constantine. The best control method consists in employing entomophagous insects such as *Pharoscyrmus anchorago* and *Cybocephalus seminulum*.

A beetle, *Apate monachus*, which is also somewhat commonly met with, forms tunnels in the midrib of the leaves.

After picking the dates may also be attacked by certain insects, in particular by small beetles such as *Carpophilus* and *Sylvanus* species and most of the small Lepidoptera that attack dried fruits (*Ephestia*, *Myelois*, *Plodia*, *Tinea*, *Tincola*).

PRODUCTION OF A PALM PLANTATION. — According to M. A. GUEUDIN the following are the average returns from a fifteen-year-old plantation. Each palm yields about 50 kg of fruit. At current rates the Deglet-Nour date fetches 2.50 francs per kg on the tree and the Degla and the Ghars 1 fr. per kg. In an average plantation there are 120 palms to the hectare (of all three varieties); their yield is approximately 13,300 fr., the cultivation costs and duties are 3,600 fr. which gives a clear profit of 9,700 fr. A hectare of date palms may have a land value of 100,000 fr., making the income on the plantation 9.7 %, which is a satisfactory return.

PREPARATION OF THE DEGLET-NOUR DATE AND THE UTILISATION OF THE OTHER VARIETIES. — The Deglet-Nour date being late maturing is still very astringent when it is picked and has neither the consistency, colour, nor translucence desired. To give it the required appearance the bunches are submitted to industrial ripening in bags and to supplementary maturation.

If the moisture content of the fruit is insufficient it does not keep well; in order to avoid loss by too great desiccation the water content of the fruit is regulated in accordance with its sugar content. This is called the "conditioning" of the fruit. Not all water is equally suitable for the purpose: the best are selenitic and saline waters. After the dates have been steeped they are spread out on trays and placed in a hot chamber with an atmosphere saturated with water vapour at a temperature of 80°C. They are then dried rapidly in dry warm air. The passage of the dates into the hot chamber acts also as pasteurisation.

Dried or fresh dates of other varieties may be utilised after removal of the

stones for the manufacture of jams. They may also be transformed into date paste. Dried dates are also used for making meals.

Syrups obtained by pressing dates when concentrated give date honey. Dates ferment rapidly and can thus serve for the manufacture of date wine or date spirit (the yield is 25 litres of alcohol per 100 kg of dates).

The stones may be utilised as fuel or after soaking may be fed to goats.

J. LEGROS.

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SCHLAICH, Observations fondamentales concernant la création d'une palmeraie en terrain neuf.

**Miscellanea.**

**Rice.**

THE RICE INDUSTRY IN JAPAN. — A communication from the Ministry of Agriculture and Forests of Japan states that the rice crop of 1931 is 5 % below the average for the last five years. The total was about 57 million *kokus* (1 *koku* = 1.804 hectolitres). This situation has forced the Government to take certain measures. The exports have been suspended and it has been decided to institute agricultural insurance to cover damage to rice fields and mulberry orchards caused by hail, flood or other 'acts of God'. (*Bulletin Economique de l'Indochine*, Octobre 1931).

RICE GROWING IN MAURITIUS. — Rice has never been grown in Mauritius as an industrial crop, though certain efforts have been made to introduce it. Some growers regard rice as a luxury food crop, others while still planting only a comparatively small area market what is over after supplying their own requirements.

As a result of the slump in sugar a Central Committee was formed in 1926 to study rice growing on a small scale. But the industry has not developed and now there are only 300 acres under rice in Mauritius. Should the crop be abandoned altogether? The writer considers that though rice cannot from economic reasons become a staple

crop it should be regarded as one of the secondary crops and be grown to a greater or lesser extent according to the size of the farm. (P. DE SORNAY, in *La Revue Agricole de l'Île Maurice*, janvier-février 1931).

### Sugar Cane.

SUGAR CANE GROWING IN INDOCHINA. — Cane has been cultivated in Indochina from time immemorial but it is only during the last 10 years that Europeans have begun to take an interest in it.

The main varieties grown by the people of Annam are the 'Mia-Lau' and the 'Mia-Vang'. The former is a small, fine, very hardy cane, growing almost everywhere but giving a very low yield and requiring extra labour for harvesting owing to its leafy growth.

The Mia-Vang is of more interest. It is unfortunately less robust and is susceptible to drought.

Planting of both canes is done by sets. The crop is annual and alternates in some cases with rice. The native cane plantations are not able to supply a European sugar factory. There are only two European sugar producing companies and their activities are still hampered by a number of difficulties. In fact the cultivation of cane on an industrial scale has not been sufficiently studied and it is not yet known which are the most suitable varieties. The Agricultural Departments of the Colony are taking up the question and it is to be hoped that after a thorough study has been made of the suitable soils and varieties and adequate trials have been carried out a successful industry of sugar planting and manufacture will be established. (*L'Agriculture pratique des Pays chauds*, décembre 1931).

J. I.

### Cotton.

COTTON CULTIVATION ON THE IVORY COAST. — Experiments carried out at Bouaké have shown that the only species of cotton adapted for growing on the Ivory Coast are *Gossypium barbadense* and the "Ishan". Seed should be sown during the second half of June. Rows should be 1 to 1.2 m apart and the stools should be 0.7 m apart in the row. Topping takes place when the first flowers open, which is during September. There should be a two-yearly rotation with a leguminous crop to preserve the fertility of the soil and check erosion; the legume may also serve as a green manure.

The Government Textiles Department distributes selected seed. (*L'Association Cotonnière Coloniale*, janvier 1932).

THE COTTON SITUATION IN SYRIA. — The present crisis in the cotton trade seems to have affected Syria less than the other cotton-producing countries, with the result that the growers are extending the acreage under cotton.

Cotton is cultivated in Syria under the following 4 systems:—

(1) *Share tenancy*, which is practised on irrigated land (American and Egyptian cotton) and on non-irrigated land (American and "baladi" cotton) and is the predominating system, being that in use over 75 % of the total cotton growing area.

(2) *Association between the owner of the land and an agriculturist who has capital available*. — This method is practised only on irrigated land.

(3) *Tenant farming* is practised on irrigated land. The land is usually rented for a period of 3 years and the tenant has a right to the irrigation water.

(4) *Direct farming* is practised by certain large and small landowners on irrigated and non-irrigated land. (*L'Association Cotonnière Coloniale*, janvier 1932).

### Coffee.

COFFEE GROWING IN ERITREA. — Coffee can be grown on the eastern slopes of the mountains at a height of from 1300 to 1700 metres; in these regions there are two rainy seasons with sufficient rainfall for the requirements of coffee. There are thus 7000 to 8000 hectares available.

The first attempts to introduce coffee were made 30 years ago. Now there are some hundreds of thousands of trees covering about 600 hectares planted by natives or Italians. The Agricultural Services of the Colony are trying to develop the industry by propaganda, specially among the natives and by producing and distributing young coffee plants free of charge. The chief varieties grown are the "Ennaria" and the "Moka", both belonging to *Coffea arabica*. Certain hybrids also are being tried.

There is little doubt that in the near future all the suitable land will be planted with coffee. (Prof. NALLO MAZZOCCHI ALEMANNI in the *Rassegna Economica delle Colonie*, Novembre-Dicembre 1931).

### Root Crops.

INFLUENCE OF CULTIVATION AND IRRIGATION ON THE SUGAR AND PROTEIN CONTENT OF SWEET POTATOES. — According to P. MENENDEZ LEES and M. DE MEDINA the amount of alcohol obtained per hectare from sweet potatoes is increased by 2 % by a second hoeing accompanied with irrigation as compared with that obtained from plots hoed but not irrigated. (*Revista de la Facultad de Agronomía*, Montevideo, Uruguay, No. 5, 1931).

### Tree Fruits.

PROPAGATION OF TROPICAL TREE FRUITS AT THE UNION EXPERIMENT STATION, ST. LUCIA, BRITISH WEST INDIES. — According to E. A. WALTERS grafting with shoots of which the tissues have been made more active by giving the plant abundant food and water gives very encouraging results with mangoes and avocados. (*Tropical Agriculture*, Vol. IX, No. 2, 1932).

CULTIVATION OF THE CAROB-TREE IN URUGUAY AND THE CHEMICAL COMPOSITION OF THE FRUITS. — MENENDEZ LEES and QUINTEROS find that the soil and climate of Uruguay are perfectly adapted for the cultivation of the carob-tree. The composition of carobs picked in this country does not differ from that of those from countries situated within the natural distribution of the tree. (*Revista de la Facultad de Agronomía*, Montevideo, Uruguay, 1931, No. 5).

AN ECONOMIC METHOD OF GROWING ORANGES. — According to R. J. TRIMBLE, a large orange grower in Florida, the best method of planting is rather close together in a hexagonal arrangement. He has observed that trees planted close are less affected by pests and drought, owing to their root system being deeper. He finds also that the fruit is larger and of better quality.

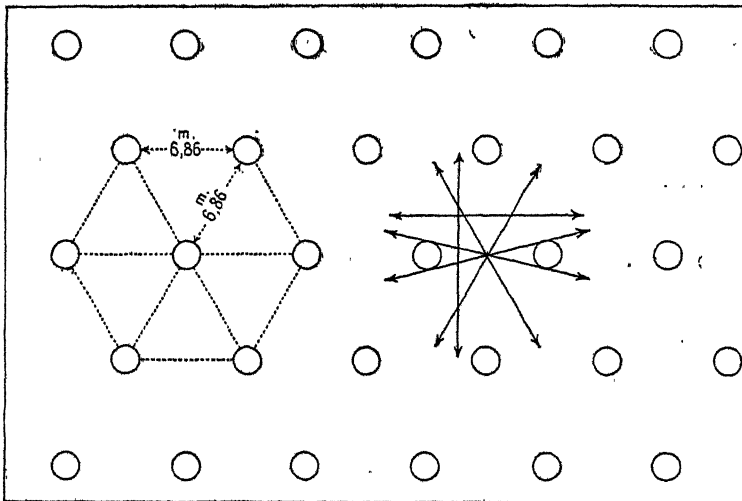


Diagram of the planting and cultivation of oranges by the TRIMBLE method.

Mr. TRIMBLE plants 100 trees to the acre, the trees being  $22\frac{1}{2}$  feet apart. The accompanying figure shows the arrangement: the small circles represent the trees and the arrows the 12 directions in which cultivation is possible.

This method reduces the costs of production by about 17 cents (dollar) per box with a mean production of 6.17 boxes per tree. (*Florida Grower*, January 1932).

J. L.



III. Morocco. — The majority of the agricultural equipment used in Morocco is imported from Europe or America.

*Imports of agricultural equipment into Morocco in 1929 (exclusive of engine and hydraulic and steam machines).*

Exporting Country	Weight in kg.	Value in francs
France . . . . .	2 087 846	10 831 187
England . . . . .	151 849	1 154 043
Germany . . . . .	284 866	1 921 720
Belgium . . . . .	17 104	74 523
Italy . . . . .	3 500	29 427
Austria . . . . .	107 528	808 742
United States . . . . .	1 737 989	10 240 671
Czechoslovakia . . . . .	21 928	113 659
Sweden . . . . .	2 830	19 962
Other countries . . . . .	451 925	1 537 307
<i>Total . . . . .</i>	<i>4 866 171</i>	<i>27 731 750</i>

*Number of tractors imported in 1929.*

Exporting country	Number	Value in francs
France . . . . .	33	959 140
Germany . . . . .	104	3 156 739
United States . . . . .	52	1 786 952
Sweden . . . . .	2	88 617
Belgium . . . . .	2	24 098
<i>Total . . . . .</i>	<i>193</i>	<i>6 010 546</i>

#### IV. French West Africa.

*Agricultural machines and implements in use in French West Africa.*

Cultivation and harvesting machinery	Number	Machines and implements for industrial treatment of products	Number
Levellers . . . . .	2	Thrashing machines . . . . .	3
Cassava lifters . . . . .	2	Mills . . . . .	3
Moulders . . . . .	6	Graders . . . . .	4
Cultivators . . . . .	3	Grain crushers . . . . .	3
Ploughs . . . . .	17 014	Coconut crushers . . . . .	109
Balance ploughs . . . . .	2	Boilers . . . . .	800
Tractor ploughs . . . . .	5	Rice decorticators . . . . .	1
Carts and wagons . . . . .	120	Coffee . . . . .	4
Sieves . . . . .	300	Groundnut " . . . . .	1
Root cutters . . . . .	4	Castor oil " . . . . .	3
Canadian cultivators . . . . .	6	Retting machines . . . . .	1
Bush-breakers . . . . .	4	Hulling machines . . . . .	2
Stubble breakers . . . . .	8	Coconut pulping machines . . . . .	6
Fertiliser spreaders . . . . .	3	Husking machines . . . . .	2
Mowers . . . . .	1	Coffee pulping machines . . . . .	17
Subsoilers . . . . .	4	Cotton ginning machines . . . . .	83
Harrows . . . . .	26 73	" " " with engine . . . . .	4
Hoes . . . . .	818	Cacao decorticating machine . . . . .	1
Pumps . . . . .	10	Maize shellers . . . . .	70
Pulverisers . . . . .	78	Kapok ginning machines . . . . .	2
Horse rakes . . . . .	2	Rubber rollers . . . . .	1
Rollers . . . . .	3	Maize mills (hand) . . . . .	1410
Seed drills . . . . .	33	" " (engine) . . . . .	28
Dusting machine . . . . .	1	Hand presses and hydraulic presses . . . . .	35
Lawn mowers . . . . .	8	Palm oil presses . . . . .	300
Sprinklers . . . . .	15	Cotton seed sorters . . . . .	1
Tractors . . . . .	59	Winnowers . . . . .	16
Motor windlasses . . . . .	8		
<i>Total . . . . .</i>	<i>21177</i>	<i>Total . . . . .</i>	<i>2910</i>

V. Senegal and the Sudan. — In *Senegal* the groundnut is the main crop and the basis of all commerce. The Government is endeavouring to improve cultivation methods by the introduction of implements. The natives have been supplied with hoes and Government employés demonstrate their use.

In the *Sudan* the agricultural equipment at present consists of two implements : a small narrow hachet used for clearing scrub and felling trees and a kind of hoe for cultivation purposes.

Ploughs have recently been distributed to the natives and it is hoped that in a few years will be firmly established.

VI. French Guinea. — The only implements used are light ploughs, hoes and certain tools such as picks, shovels and forks.

VII. Madagascar. — *East Coast Region*. — There is need for Canadian cultivators, pulverisers and extensible hoes, also for equipment for the treatment of products particularly coffee, such as pulping machines, parchment separators, sorters and various kinds of cleaning machines.

*West Coast Region*. — This region is the most developed at present. Implements in use are ploughs, harrows and Canadian cultivators. The rice is planted out mainly by hand.

*Central plateaus*. — The equipment required at present consists of reversible ploughs, harrows, Canadian cultivators and hoes.

*Imports into Madagascar from France during 1930.*

Agricultural machines	Weight	Value
	Kg.	francs
Cultivators, spring harrows, horse rakes, hay rakes, single share ploughs . . . . .	30 500	214 000
Mowers . . . . .	800	4 000
Reversible ploughs . . . . .	109 700	479 000
Other machines . . . . .	44 000	218 000
Detached parts . . . . .	21 200	97 000
Agricultural tractors . . . . .	14 400	146 000
Internal combustion engines . . . . .	3 800	65 000
Diesel . . . . .	25 500	258 000
Other . . . . .	9 000	85 000
Semi-Diesel . . . . .	12 500	118 000
Steam . . . . .	26 300	119 000
Pumps . . . . .	22 700	221 000
<i>Total</i> . . . . .	329 400	2 014 000

To these figures must be added imports from other sources.

VIII. Guadalupe. — The following implements and machines are in use: primitive type ploughs, double share wheel ploughs, a few harrows and cultivators, a few chaff-cutters and root-cutters, a few cotton ginning machines, one or two defibrating machines of the Mexican "Raspador" type, a few coffee pulping and decorticating machines and cassava graters.

*Equipment imports into Guadalupe during 1926, 1927 and 1929 (weight in kilos).*

		1926	1927	1929
Traction engines . . . . .	France . . . . .	8,050	32,102	—
	Other countries . . . . .	8,609	4,368	—
Hydraulic machines . . . . .	France . . . . .	8,339	135,585	23,574
	Other countries . . . . .	—	565	10,630
Cleaning and carding machines . . . . .	France . . . . .	—	—	—
	Other countries . . . . .	1,353	—	—
Agricultural machines . . . . .	France . . . . .	54,278	576,630	788,888
	Other countries . . . . .	4,615	4,257	28,208
Implements . . . . .	France . . . . .	9,722	682	6,510
	Other countries . . . . .	—	3,505	—



NEW COMBINE HARVESTER FOR SMALL FARMS. — Several years' study of American harvester-thrashers is beginning to produce practical results in Germany. In the December number of this *Bulletin* (1931, No. 12, p. 466) was reported the new combine of the "Deutsche Industrie Werke". Another machine has now been constructed by BRENNER at the Agricultural Engineering Institute of Bonn-Poppelsdorf. The following description is based on that of the inventor ("Beitrag zu dem Problem 'Deutscher Bauern-Mahdrescher'", in *Die Technik in der Landwirtschaft*, Berlin 1932, Nr. 1, p. 1-6).

The machine is propelled by a normal tractor and has an anterior cutter bar; there are as usual an adjustable reel and conveyor bands. The cut corn is carried on a platform towards the right where it is seized by a special conveyor chain, lifted and transported *head downwards* laterally to a small vertical thrashing apparatus. Behind the thrasher the straw is borne away by a wide conveyor chain to be bound and ejected. The grain passes over a sieve under a current of air and is then carried by an elevating screw into a cart attached behind the machine to the right.

This somewhat unusual arrangement with well distributed weight, power take-off and anterior cutter bar has the following advantages: there is no need to mow a track for the first passage of the combine, lodged grain is cut in the best direction and the machine can cut round any obstacle.

The special characteristic of this machine is that the cut grain is carried in a thin curtain to a *vertical* thrasher, which has the advantage not only of economising power but also of eliminating the need for shakers, for the grain does not become mixed with the straw and falls out more readily when vertically held.

Cutting width is 2.5 m. Power consumption is approximately 12 HP. The power take-off of the tractor (17 HP) must be adequate for heavy work and must leave a reserve of power for overloading, traction of grain carts, etc. The weight of the machine is about 1 ton.

Trials so far have shown that the machine is adapted to the conditions of Germany and further trials will be effected next harvest season.

H. J. H.

## ANIMAL HUSBANDRY

### Miscellanea.

#### General.

THE IMPORTANCE OF STOCK FARMING IN GREAT BRITAIN. — In an article published in the *Scottish Journal of Agriculture* (January 1931) Professor J. B. ORR shows and illustrates with figures the importance of stock farming in the agriculture of Great Britain. His article is intended to show that whatever the policy be, the development of intensive stock farming should be its most prominent feature and that for the following reasons:— 1. It accounts already for three-fourths of the total agricultural revenue. 2. It is at present (January 1931) on the whole either profitable or on the verge of being profitable and therefore any assistance given by the State is likely to yield a big return in the form of increased production. 3. The products of stock farming and market gardening have a special value because they can be marketed fresh. 4. Great Britain has a home market which will absorb increased production to the extent of over 200,000,000 Pounds per annum. 5. The development of intensive stock farming must be accompanied by increased labour, which would be continuously employed all the year round.

[GREAT BRITAIN: IMPROVEMENT OF LIVE STOCK ACT, 1931. — Among the measures affecting agriculture to which the Royal Assent was given on July 31, 1931 is the Improvement of Live Stock (Licensing of Bulls) Act, 1931., the object of which is to improve the quality of British commercial cattle by the elimination of inferior bulls. In view of the increasing competition from other countries, which have graded up their stocks to such an extent that they are able to send beef of excellent quality to Great Britain, it is a matter of urgent concern, as stated by the *Scottish Journal of Agriculture* (No. 4, 1931) to raise the general standard in Britain so that home-produced beef may not only retain but improve its position in the home market.

The main features of the new Act provide for:—

- 1) The licensing of bulls which attain an age to be prescribed and the prohibition, enforceable by penalties, of the use of unlicensed bulls;
- 2) The granting of permits to owners to keep bulls for limited periods for purposes other than breeding;
- 3) The slaughter or castration of bulls of the prescribed age and in respect of which a licence or permit has not been granted;
- 4) The prohibition of entry, except for slaughter, of bulls which have been rejected in Ireland.

A licence granted by the Department remains in force during the lifetime of the animal, unless suspended or resolved or unless the animal has been outside of Great Britain for a consecutive period of fourteen days or such longer period as may be allowed. Provisions are also made for the transfer of licenses when bulls are sold.

**STOCK BREEDING IN THE U. S. S. R.** — The decisions of the Central Executive Committee with regard to the economic plan for 1932 are given in the *Moskauer Rundschau* of 3 January 1932. The plan provides for the following increases in stock:— the Cattle Breeding Organisation will increase its stock from 2,100,000 to 2,950,000, the Pig Breeding Organisation from 1 million to 2 million, the Sheep Breeding Organisation from 4,780,000 to 7,300,000 and the Dairy Cattle Breeding Organisation from 260,000 to 320,000 cows.

The number of cows belonging to the milk 'Kolchoscentr' (collective farming centre) will be raised to 2,700,000; the number of pigs of the pig 'Kolchoscentr' will by the end of 1932 be 4,500,000; the stock of the sheep 'Kolchoscentr' will be 9 million.

The supplies of the Stock Breeding Trust of the Agricultural Commissariat are fixed at 162,000 tons of meat and 548,000 tons of milk; the compulsory output of the 'Kolchoses' (collective farms) is fixed at 182,000 tons of meat and 1,375,000 tons of milk.

#### Genetics.

**ZEBU-YAK HYBRIDS.** — M. ZAWADOWSKY of the Moscow Laboratory of Experimental Biology gives in the *Journal of Heredity*, October 1931, a detailed description of the results obtained with crossings between the zebu and the yak, which have been carried out in the Moscow Zoological Park. The principal conclusions of the writer are the following:—

- 1) The male hybrids of the  $F_1$  and  $F_2$  progeny are sterile. 2) The infecundity of the male hybrids is due to the fact that their testicles produce no spermatozoa; 3) The histological study of the testicles showed that the seminal canals while having a well developed interstitial tissue have at the same time only the cells of Sertoli type and spermatogonia. There is no spermatogenesis at all, only its earliest phases can be discovered in some canals. 4) Despite the absence of spermatogenesis, the males have the secondary sexual characters and the sexual instinct fully developed. 5) The female hybrids of the  $F_1$  and  $F_2$  progeny are fecund when crossed with either the zebu or the yak. 6) The phenomenon of heterosis may be observed in the  $F_1$  generation (the hybrids are bigger than their pure bred parents). 7) In spite of the remoteness of the zebu and the yak in the taxonomic system (different genera) Mendelian segregation takes place in their progeny. 8) The segregation can be observed in the following pairs of characteristics:— coat colour, length of hair of body, fringe, length of tail hair, shape of hump, shape of horns, shape of muzzle, general body proportions. 9) As to coat colour we can state that the black brown tint of the yak is dominant over the grey colour of the zebu. 10) As to the length of the hair of the body, we can speak of an incomplete dominance of the short-haired zebu over the long-haired yak, or to be more exact, of a middle type of inheritance. 11) The absence of fringe is dominant. The fringe is a recessive character. 12) The tail of the yak type covered with long hair all along, is dominant over the zebu type of tail with a tassel at the end. The length and thickness of the tail hair in general is probably determined by no less than two pairs of genes; one of them affects the development of the tassel of the tail and the other affects the length of the hair of the body in general. 13) The shape of the hump of the yak is evidently dominant over that of the zebu. 14) The shape of the horns of the yak and the zebu is evidently determined by no less than two pairs of genes. As a result of the crossing of a yak and a zebu a new formation in the shape of horns takes place in the first generation. 15) When a zebu and a yak are crossed the hybrids of the  $F_1$  generation have an intermediate shape of muzzle, whose type is nearer to that of the muzzle of the zebu, with obvious segregation in the  $F_2$  gene-

ration. 16) Hornlessness is the dominating characteristic when a horned zebu and a hornless yak are crossed. 17) The long bony form of the body of the yak is dominant over the big square form of the body of the zebu. In the second generation some signs of segregation may be observed.

**INBREEDING SHEEP.** — Constant inbreeding over a period of fifteen years during which no outside blood was introduced for seven generations resulted in a material decrease in the size of sheep at the New Hampshire Agricultural Experiment Station according to *Bulletin* 250, and this in spite of constant elimination of undersized offspring. The fertility rate however increased, the percentage of twins born in the later generations being considerably greater. This may be in part responsible for the decrease in size due to lack of sufficient milk for the support of two lambs. In an effort to increase the number of nipples in sheep an attempt was made to establish a strain which possesses four functional nipples. Higher milk yielding capacity seems to be associated with this multi-nipples trait but the majority of the offspring possessed only two functional nipples. To date only six females have been obtained with four functional nipples.

### Cattle.

**CATTLE IN APULIA, ITALY.** — The greater part of the cattle in Apulia belong to the Podolian breed (*Bos taurus primigenius*). Some writers distinguish mountain and lowland varieties, but such a distinction is somewhat artificial because the difference in size on which it principally depends is not invariably present. There are some cross-breeds resulting from crossing with the Romagna, Modica, Brown Swiss, Simmenthal and other breeds. There are also a certain number of cows of the brown alpine breed which are bred for the production of milk for consumption and for making fresh milk foods. Where abundant forage is available Friesian cattle are bred.

In the *Critica Zootecnica* (July, 1931) Francesco NITTI describes the Apulian breed, its purposes (mainly labour), feeding, breeding and housing, and gives a summary of the present provisions for the improvement of cattle in Apulia. He rejects most of the suggestions for improvement in favour of crossing with bulls of the Romagna breed, which he considers will transform the Apulian cattle into a good beef breed by improving their assimilation of food and making them early maturing. Their capacity for work would not be impaired. The cross-breeding should be confined to a single pair in order to avoid too great refinement and reduction in size. The writer recommends a number of improvements in the forage production and in the arrangement of cattle sheds.

**CATTLE IN PANTELLERIA AND THE PELAGIC ISLANDS, ITALY.** — Dr. F. BELFONTE describes in the *Critica Zootecnica* the cattle breeding of these islands which has several points of interest. Until 20 years ago the island of Pantelleria had 3 times as great a head of cattle as now. In the past cattle were bred not only for beef and milk but also for work; now these animals have completely disappeared and there remains only a vestige of the Pantelleria breed. A detailed description is given of this lost breed, which much resembled the Sicilian Mezzalina variety. The cattle of the islands of Lampedusa and Linosa were smaller than those of Pantelleria, but otherwise similar. The cattle farmers of Pantelleria realised the possibility of improving the breed by cross-breeding and 30 years ago introduced the first breeding stock from the neighbouring Tunisia. Amongst the various breeds existing in this region of North Africa was chosen that originating from the Canton of Abondance in Savoy, France. The type of crossing for substitution was chosen and a breed closely resembling the French one was formed. The cross-bred type may be regarded as satisfactory and Pantelleria to-day possesses cattle with a high yield of milk and beef.

**GREY-BROWN MOUNTAIN CATTLE IN THE OBERALLGÄU, BAVARIA.** — This breed was the subject of a thesis for the doctorate by M. G. WIEDEMANN, presented to the University of Jena in 1931.

The natural and economic conditions of the Oberallgäu and their influence on cattle breeding are discussed, and the development and methods of the present industry are traced. The capacities of the breed are described as are also the official and private measures adopted for promoting cattle breeding.

The writer discusses also ways and means of increasing the returns from the industry.

He calls attention not only to the production of milk but also to that of beef and work. Good bulls should be used for breeding much longer than they are at present, but stock should not be bred too young. One of the most important measures for developing and improving the cattle is, according to the writer, the development of dairy cow testing. Animals should be allowed daily exercise in the open during the time they are confined in the sheds. Lastly the false economy in feeding whole milk to calves must be given up, for it can only result in producing animals with a low capacity for utilising feed, a poor herd and low yields.

### Pigs.

PIG BREEDING IN THE ISLAND OF ZEA, GREECE. — In the *Bulletin de la Société Nationale d'Acclimatation de France* (No 10, 1931) Dr. C. PAPATANASOPOULOS gives an interesting account of the results of his studies of stock breeding in the Cyclades Islands, which have been investigated as regards soil, climate, fauna and flora but never previously as regards domestic animals. He found a breed of sheep in the N. W. of the island of Scopelos which is one of the best known. In the island of Tinos he recognised that the cow gives a high yield in work and milk. Other animals also, such as the ponies and mules of Skyros, strengthen the writer's opinion that these islands in the Aegean are important for stock breeding.

He has been able to prove that the original home of the so-called Andros pigs is really the island of Zea, and that they have spread from there to the other islands. About 60 years ago foreign pigs were introduced into Zea to improve the local breed. The writer endeavoured to find the primitive type of pig in the island but it has completely disappeared as a result of cross-breeding. He considers that the primitive type must have belonged to the 'Iberian' race for all the characteristics of this race are present in the improved breed. The first attempt to improve these pigs was made by the introduction of varieties of the 'Malta' or 'Maltese' pig, but it was only the introduction 4 or 5 years ago of a 'Large Black' boar that gave the island its present highly improved breed.

There are still difficulties in the island of Zea in the rational feeding of pigs, in spite of the abundance of acorns, because these are largely used in the leather industry. The writer considers however that Zea and the other Cyclades Islands are well suited to the development of pig breeding.

### Ostriches.

OSTRICH FARMING IN NORTH AFRICA. — The *Vie agricole et rurale* (Paris, 1931, No. 36) gives an interesting account of an ostrich farm recently started in Morocco, where the favourable climate should give better results than have been obtained in Algeria and Tunisia. In captivity the ostrich feeds on barley, green forage, cabbages, mangolds, and refuses the locusts that it eats when wild. In southern Abyssinia the natives fatten young ostriches for food and for the production of a fat which formerly was highly valued by the Arabs. Ancient writers in fact regarded the ostrich as an edible animal. The eggs are much appreciated and weigh 1200 to 1700 grammes without the shell. Nowadays the commercial value of the feathers is such that the food value of the bird loses its interest.

S. T.

## AGRICULTURAL INDUSTRIES

### The Ice Cream Industry (*Part II*) (1).

The processes of manufacturing ice cream consist in general in mixing the ingredients, pasteurisation and homogenisation, then cooling the mixture and allowing it to age. Then comes the essential part of the process: the mixture is congealed and whipped in the freezer. The product flows out of the freezer in the form

(1) For Part I see the *Monthly Bulletin of Agricultural Science and Practice* 1932, No. 2, pp. 58-64.

of a paste, passes into the hardening chambers and then to the cold store to await sale.

The mixture is generally made according to recipes but the ingredients vary so much in composition that the recipes serve only as a basis. In the large factories the mixtures are rectified after analysis of the content in fats, acid and solids not fat. The final mixture is controlled by analysis or calculation. For the latter the CARRÉ method is used, but adapted to the complex composition of ice cream mixtures.

The composition of ice cream generally varies within the following limits :— fats 8-16 %, solids not fat 6-13 %, sugar, exclusive of the lactose in the whey, 10-18 %, water 60-70 %. There are also small quantities of gelatine, flavouring, etc. LICHTENBERGER gives the following composition for a basic mixture :— 22 parts of whole milk (3.3-3.5 %), 10 parts of cream (40 %), 19 parts of condensed milk (8.5 per cent. of fat), 0.5 % of gelatine and 12-16 parts of sugar according to prospective use. Certain dairies have mixing stations where the basic mixtures are prepared in bulk. The mixing machines (*Fig. 1*) can be heated and are fitted with agitators. The cream is introduced first into the mixer while slowly starting the agitator, then the dried skim milk and gelatine are gradually added and the mixture heated to 45° by opening the steam valve. At this temperature the sugar is added, then the temperature is raised to 65° while the mixture is continually stirred. This treatment constitutes the *pasteurisation*. The flavour, texture and consistency of the ice cream are not appreciably affected by the temperature of pasteurisation except at 180° F (82°C). The effect of pasteurisation is not only to dissolve the gelatine, sugar and dried milk but also to kill any bacteria and germs contained in the ingredients. With increasing temperatures of pasteurisation the viscosity and the volume of the fat globules are reduced. After passing through a special filter to remove any impurities the mixture reaches the homogeniser (*Fig. 2*).

The main purpose of *homogenisation* is to break up and disperse completely the fat globules, preventing the formation of butter and improving the texture and whipping capacity of the mixture. Defective homogenisation is often met with ; it is essential to inspect the machine regularly and closely supervise the process. The pressure of homogenisation should be between 2000 and 4000 pounds ; it may be influenced by the chemical composition of the mixture and of the ingredients, by the acidity of the mixture, the degree of heating and the quantity of gelatine used. A definite relationship has been established between the quantity of gelatine and the pressure used. The equilibrium varies according to the mixture and the machine used and must be determined for each installation. A margin of 500 to 1000 pounds can however be allowed without serious results.

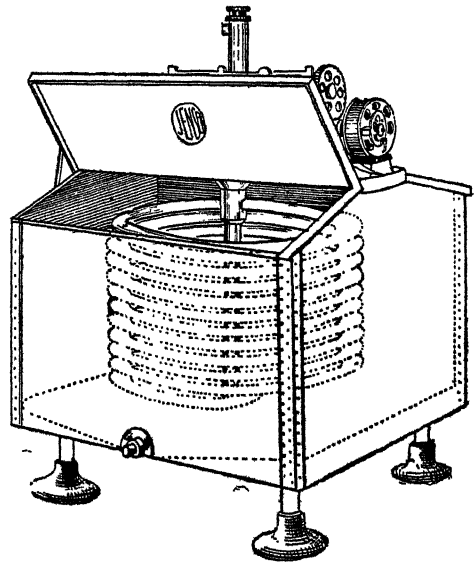


FIG. 1. — Ice cream mixer.

From the homogeniser the mixture passes at a temperature of about  $50^{\circ}\text{C}$  through the cooling coils into the *maturation* columns.

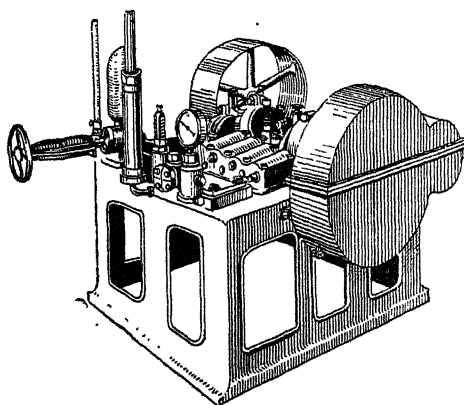


FIG. 2. — Ice cream homogeniser.

This consists of a metal cylinder with a double jacket in which a low temperature is produced by circulating brine or by direct vaporisation. The mixture is continuously beaten by agitators in the freezer while scrapers remove the layers of ice as they form on the cooled walls of the cylinder. The rate of freezing can be regulated by the quantity and temperature of the brine and by the rate of beating.

The mixture when it reaches the freezer has already been cooled nearly to freezing point. As soon as part of the water of the mixture is frozen the circulation of brine is stopped, but the agitation is continued to produce the required bulk; before the mixture solidifies it is removed from the freezer. At this moment about 15 to 40 % of the water is frozen. The ice cream immediately passes to the hardening chamber where the process of congelation is completed at a temperature of from  $-12^{\circ}$  to  $-30^{\circ}\text{C}$ .

According to T. HAHN the main factors determining the time required for congelation are: — (a) the temperature of the mixture on entering the freezer: the maximum should be  $40^{\circ}\text{F}$  and the minimum  $35^{\circ}\text{F}$ . Too high a temperature results in the formation of butter and lengthens the time required. (b) The percentages of fat and sugar in the mixture. The former directly affects the time required for congelation, while the greater the concentration of sugar the

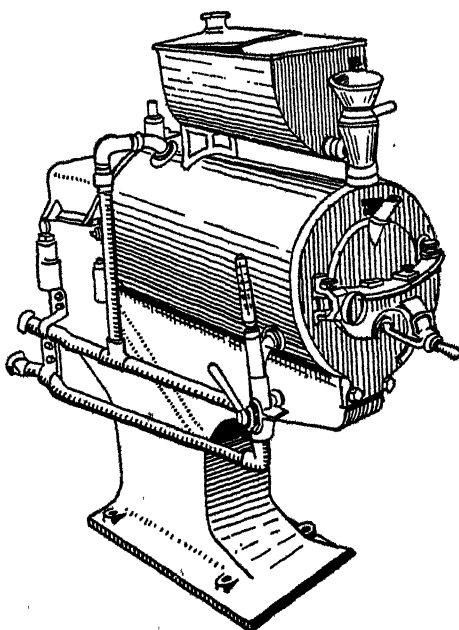


FIG. 3. — Ice cream freezer.

lower is the freezing point. (c) The temperature of the brine. The temperature recognised as best for rapid freezing is between 0°F and -8°F. (d) The quantity of brine and its rate of circulation. See the following table:

Capacity of freezer	Rate of circulation of brine
40 quarts. . . . .	145.40 to 181.75 litres per minute
50 " . . . . .	181.75 " 218.10 " " "
80 " . . . . .	218.10 " 290.80 " " "
100 " . . . . .	290.80 " 368.50 " " "

(e) The size of the inlet openings and tubes for the brine. (f) The area of the freezing surface of the inner cylinder. The cylinders at present in use are practical and economical and no advantage would be gained by increasing their dimensions. (g) The completeness of insulation. The outside of the jacket should never show traces of rime or some of the efficacy of the brine would be lost. (h) The heat conductivity of the metal. Nickel cylinders, silver plated on the inner surface are best. (i) The blades of the agitator-scrapers. The cylinder must be perfect in construction so that the beaters touch the walls gently and the scrapers come in contact with every part of the surface. The swelling produced during freezing is expressed as a percentage of the original volume of the mixture. The increase rarely exceeds 70 to 110 %. In most cases ice cream is sold with a volume increased by 85 to 100 %. The swelling depends on the composition of the mixture or the conditions of freezing and the quantity of air incorporated during beating and may vary between 0 % and 175 %.

The mixture is beaten until sufficient air has been incorporated to produce the required bulk. HALL (3) states that independently of all other conditions maximum swelling is obtained with a temperature of about -3.25°C. At this temperature the mixture seems to have the maximum power of absorption. In a series of experiments carried out by him in which the temperature of the mixture was kept at -3.25° during the beating, after stopping the circulation of the brine, a maximum swelling of 105 % was obtained in 14 minutes and remained constant. With higher and lower temperatures the swelling was inferior.

The composition of the mixture as well as its temperature influences swelling. If the content in fat or sugar or solids not fat is too high a large swelling is not obtained. Gelatine seems to increase swelling as well as homogenisation. With regard to the degree of acidity there are divergent opinions. The influence of various salts on the swelling of ice cream has been studied by SOMMER and YOUNG. Their results were the following:— Citrate of sodium added before ageing in the proportion of 0.4 % gives a remarkable increase. If the same salt is used in smaller quantities or is added after ageing and immediately before freezing it has no effect. Calcium lactate added at a rate of even 0.1 % reduces swelling, and at 0.5 % this action is marked. In general it may be said that any additions which increase swelling reduce the concentration of calcium ions, while an increase of calcium ions reduces swelling.

The rate and rhythm of motion of the agitator and possibly also its type of construction affect swelling.

After freezing the ice cream must be *hardened*, which means that the water remaining in a liquid state must be frozen as rapidly as possible so that it forms small crystals. For this the temperature must reach -15°C, but even then not all

the water is transformed into ice on account of the high concentration of sugar. The ice cream must not however be left at such a low temperature for too long or the flavour will be affected. When it is sufficiently hardened it is placed in cold storage at  $-8^{\circ}$  to  $-10^{\circ}\text{C}$ .

The ice cream is hardened in boxes holding 20 litres and delivered to the retailer. When the block is divided up by the seller some of the contained air escapes and, ice cream being sold by volume rather than weight, this constitutes a loss for the seller which may reach, as much as 30 %. The loss is greater or smaller according to the volume of the air bubbles contained in the ice cream. It is thus less in homogenised cream, for homogenisation reduces the size of the bubbles. The loss is less also when there is a high content in fat, but increases with the content in sugar and solids not fat.

*Description of a medium-sized ice cream factory (Fig. 4).* — The less perishable raw materials are kept in the storeroom (G) which forms the 3rd floor.

The cold chambers for storing the perishable ingredients are on the 2nd floor, as are also the room with the mixing machines (M) and the ageing room (V). All the ingredients (except fruits and flavourings) are warmed and kept at  $65^{\circ}$  for 30 minutes, then mixed in room M.

The mixture is passed to the 1st floor where it passes first through a filter (Fi) then into the homogeniser (H) and then into the low temperature refrigerator (R).

The mixture is then pumped up to the 2nd floor into the ageing columns ( $V_1, V_2, V_3$ ).

From the ageing columns the mixture flows into the 6 refrigerators ( $R_1, R_2, R_3, R_4, R_5, R_6$ ) on the first floor, where the beating, freezing and swelling take place.

The flavouring substances are added early in the freezing process, the fruits towards the end.

The product emerges from the refrigerator in the form of a viscous mass; the discharge pipes (T, T) carry it into the room B on the ground floor where it is immediately put into cans or special packages and then transferred to the hardening room (D). In the hardening chambers which are kept at  $-28^{\circ}\text{C}$  it remains for 12 hours to secure complete hardening; it is then ready for expedition and passes directly to the camions.

The offices, laboratory and washing rooms are also on the ground floor.

As in town dairies the premises for the containers and machinery are in the basement. The crude ice is also kept there and transported by an elevator (E) to the refrigerator (GL) where is also the ice crusher. The ice and crude salt (S) fall through wooden tubes into the corresponding compartments of the special wagons.

The machines used in ice cream factories are for the most part the same as those used in dairies.

The essential points of an ice cream of quality are given by the flavour, the consistency and texture, the richness, the bacterial content, the appearance and the packing.

Of these six points the most important is flavour, for ice cream must be pleasing to the palate as well as hygienic. An ice cream otherwise of good quality is often of little value owing to defects in flavour or insufficient flavour.

Amongst defects in flavour often met with is a cooked taste, due to a too prolonged heating during the preparation of the mixture. This taste may also result from the use of skim milk powder of an inferior quality or of low quality condensed milk. The use of cheap synthetic flavourings gives an artificial flavour.



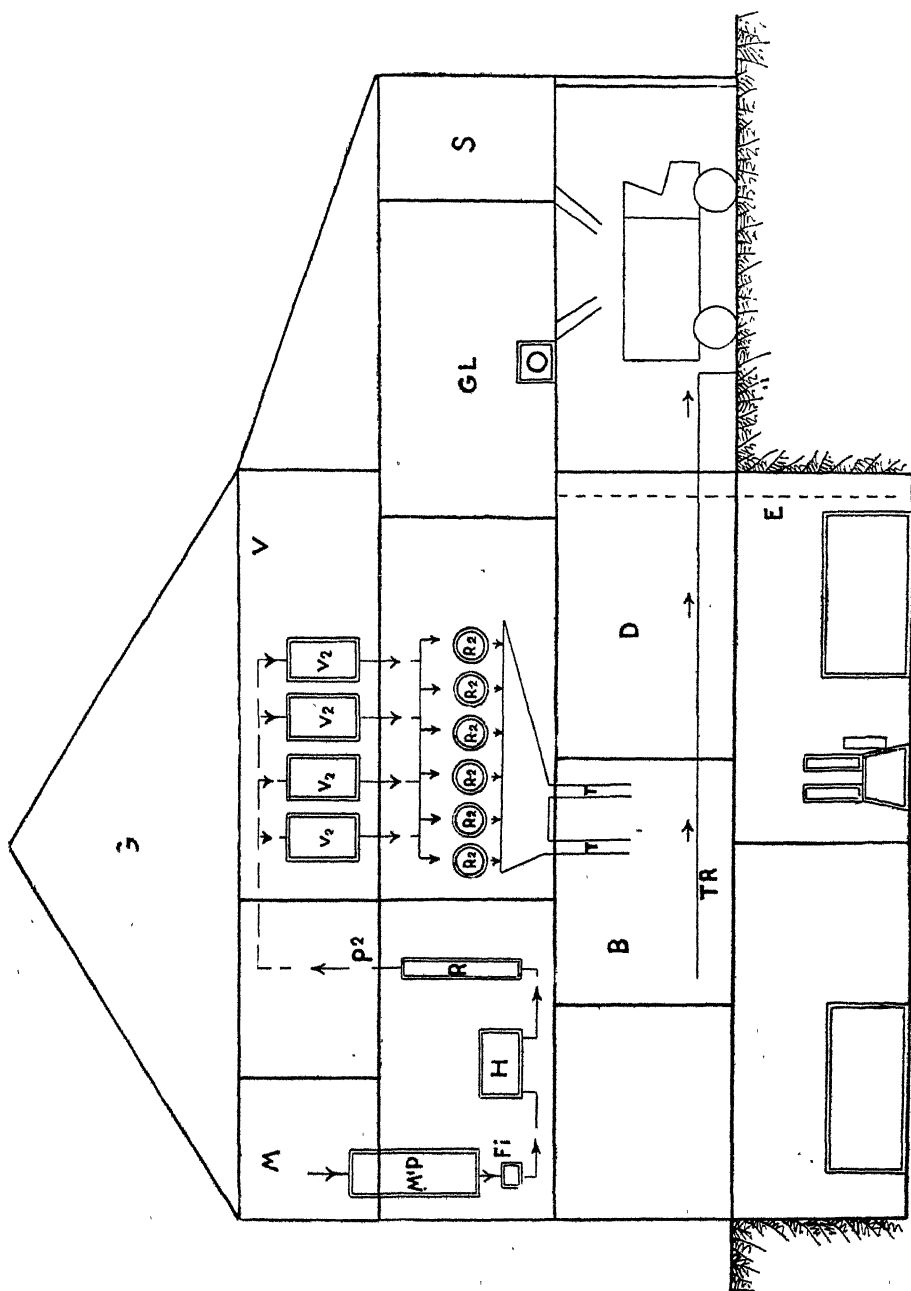


FIG. 4. — Plan of an ice cream factory.

A rancid taste is met with in ice cream in which the fat is made up largely of poor quality butter. The fat is probably decomposed by bacteria but possibly also by the action of enzymes. A metallic flavour results from the use of rusty or deteriorated containers. A slightly sour favour comes from ageing or storage at too high temperatures. A powdery flavour is due to the use of a poor quality milk powder.insipidity may be caused by insufficient flavouring, which gives the impression of eating frozen and sweetened milk or by insufficient sugar, butter fat or the solid parts of whey. A stale taste is caused by the use of flat butter or too long storage.

Consistency and texture come next and their importance cannot be overestimated. The commonest defects are granulation and sandiness, a light and flocculent texture, a heavy and cooked cream, butyric and greasy cream.

A sandy texture results from an abnormal content in the solids not fat of the milk and particularly in lactose. Thus in certain experiments a mixture containing 18.5 % of solids not fat had a sandy texture only 6 days after freezing, while a mixture containing 12.5 % of these solids remained for 27 days without developing a sandy texture, and mixtures containing 9.5 % or less were free from sandiness even after 87 days in the hardening chambers. A content of 12.5 % of solids not fat corresponds to about 6.7 % of lactose, which approaches the limit recommended by BOTHELL.

These facts show that another important factor in sandiness is the age of the ice cream : the older the cream the more liable is it to have a sandy texture. And the higher the content in lactose the more rapidly will the sugar crystals become apparent to the taste.

Pasteurisation, particularly when the milk products used contain crystallised lactose, helps to retard the development of sandiness in mixtures in which the lactose content is higher than is recommended and may completely prevent sandiness in a mixture of good composition. A mixture composed of milk products containing crystallised lactose, if not pasteurised will begin to develop sandiness immediately after freezing, setting aside the composition of the mixture. The larger the crystals are in the raw product the more apparent will the sandy texture be in the finished ice cream.

A light or flocculant cream is due to its having swollen too much, while a thick cream comes from too little air having been incorporated.

Defects in richness can be due only to excess or insufficiency of butter fat and of solids not fat. Standardisation of a mixture with a fat content of 8 to 10 % will be most satisfactory to the taste.

The bacterial content is one of the most important characteristics of ice cream. A content of less than 20,000 per c.c. is as satisfactory as possible.

Packing is also important. Cartons are found satisfactory, also bricks, provided that the ice cream is really hard and first well wrapped in greaseproof paper.

Installations for preserving ice cream are of two main types, the mechanical refrigerator without ice and the ice chamber with ice and salt. The former is inconveniently costly for small shops but its obvious advantages are such that it is strongly recommended.

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When the development of the ice cream industry in the United States and the enormous quantity of milk absorbed daily by the industry are considered one realises the importance of the industry as a market for milk. In Europe also there is a

movement in favour of the industry and though the consumption per head will never reach the proportions attained in America it may continue to develop. The industry should be promoted as an outlet for increased milk production and in view of the fact that ice cream can be recommended as a hygienic and nutritious food.

E. GASSER.

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## BOOK NOTICES \*

### Horticulture.

BOTTNERD Johannes, GLEISBERG Johannes, SIEVERT Rudolf und WEINBAUSEN Karl, *Neuzeitlicher Gemüsebau unter Glas*, 193 p., 49 Fig., Frankfurt (Oder) 1930, Gartenbauverlag Trowitzsch & Sohn.

[This textbook on French gardening is of particular value and interest as it is written by expert market gardeners. In addition to the technical experience acquired in growing different vegetables under glass the writers give an exhaustive study of the economic side of the subject from national and private standpoints. The detailed accounts of systems of construction of glasshouses and beds, equipment, aeration, shading, heating plant, fuels, etc. will be of particular interest to anyone intending to take up this form of vegetable growing and of no less value to those already established in the industry].

N. v. G.

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\* Under this heading are included short synopses of books received for review.

## Agricultural Engineering.

CORRADO RUGGIERO, *Utilizzazione delle acque per irrigazione*, II<sup>a</sup> Edizione, 548 p., 361 fig. Padova 1932, C. E. D. A. M. Casa Editrice Dott. Antonio Milani (già Litotipo).

[A second edition, revised and enlarged, of an exhaustive study by a Professor at the Padua Engineering College of the utilisation of irrigation waters; the subject is treated in its technical, agricultural, economic and legislative aspects. The chapter headings are as follows:— Determination of the quantity of irrigation water, origin, nature and effects of irrigation waters, distribution of irrigation water, tapping of surface waters, tapping of underground waters, delivery of irrigation water, systems of irrigation, irrigation by mechanically raised water, aesthetic aspects, development of irrigation in Italy, irrigation outside Italy.]

The progress achieved during the five years since the publication of the first edition has necessitated certain changes and additions, particularly in the sections dealing with spray irrigation, utilisation of sewage water, well pumps, effects of the temperature of irrigation water, quantities of water to use, experiments with filter tunnels, recent studies of irrigation by windmills, reservoir capacities and irrigation in land development. The chapters on irrigation in Italy and elsewhere are new. The work is well illustrated with figures and charts].

ROGIN Leo, *The Introduction of Farm Machinery and its Relation to Productivity of Labour in the Agriculture of the United States during the Nineteenth Century*, 260 pp., 84 fig. University of California, Berkeley, 1931.

[This study of the influence of machinery on the productivity of labour in the United States is subdivided into two chapters, one dealing with machines for the preparation of the soil, the other with machinery for wheat production. The writer traces the historical development of the use of machinery and shows how machines have reduced the hours of labour required for agricultural production].

PAULSEN K., *Reparaturwerkstätten für Landmaschinen*, 124 p., Berlin 1931, Reichskuratorium für Wirtschaftlichkeit, Veröffentlichung Nr. 64.

[This small volume dealing with farm machine repair shops is published with a view to bringing the workshops into line with modern improvements, and giving useful information to farmers and engineers about to set up new repair shops in order that they may not install plant which cannot be used economically.]

The subject comes within the province of the 'Reichskuratorium für Technik in der Landwirtschaft' (German Agricultural Engineering Council) so that it is surprising to find it published by the 'Reichskuratorium für Wirtschaftlichkeit' (German Economic Council)].

MINISTRY OF AGRICULTURE AND FISHERIES, *First Report of the Agricultural Machinery Testing Committee*, London, His Majesty's Stationery Office, 1931, 24 Certificates and Reports issued.

[The reports are of 24 tests carried out from 1926 to 1930 and are concerned mainly with farm tractors and engines and dairy machinery].

KÖHNE Georg, *Handbuch der Landmaschinentechnik*, II. Band, 1. Lieferung: *Die Geräte und Maschinen zur Ernte. Die Maschinen zur Körnergewinnung und Saatkuttbereitung*, 264 p., 720 fig., Berlin, Julius Springer, 1932.

[This work is the first section of Vol. II of the *Manual of the Technique of Farm Machinery*, the first volume of which was very well received.]

Vol. I dealt with machines and implements for tillage, tractors, implements hauled, rotary tillers, fertiliser spreaders, drills, transplanting machines and implements and machines for cultural operations.

Vol. II is concerned with machines and implements for harvesting and after-treatment of crops, such as mowers and reapers, hay-making machinery, potato lifters, sugar beet harvesting machines and implements, thrashing machines, machines and plant for the cleaning and preparation of seed.

As has already been said (see *International Review of Agriculture*, 1928, No. 10, p. 892, and 1930, No. 3, p. 102) the special value of the *Manual* lies in the fact that the subject is treated from the standpoint of the construction of the machinery.

This section deals particularly with mowing and harvesting machines and is illustrated by 720 excellent diagrams showing construction details and a plate giving a longitudinal section of a thrasher].

MCCORMICK Cyrus, *The Century of the Reaper*. Boston and New York, Houghton Mifflin Company, 1931, 307 pp., illustr.

[An interesting account of the invention of the reaper by Cyrus Hall MCCORMICK, grandfather of the author, and of the development of the International Harvester Company, published on the occasion of the centenary of the invention of the reaper.

The commercial production and distribution of an invention are often as important in its success as the invention itself. MCCORMICK had the genius which combined the qualities essential for the commercial development as well as the technical perfecting of his invention.

The origin of the International Harvester Company, which is now the leading agricultural machinery producing firm in the world, is described with a short account of its systems of production and administration. The chief secret of the remarkable development of the firm is bound up in this as in other cases with the personality and abilities of the directors. An interesting feature of the organisation of this company is the value attached to the experience of the carefully selected and skilled personnel].

### Wine Production.

DORMONTAL, Charles, *Sauternes, "Pays d'Or et de Diamant"*, 212 p., 1 carte. Bordeaux (édition J. Bière). 1930.

[This interesting monograph on the region received a prize from the French Academy. The writer describes the characteristics of the country, the wine industry and local customs. The book, is not a scientific work, but rather aims at propaganda and gives in a well written and attractive form a considerable amount of information of value to those interested in any one of the celebrated products of the country round Bordeaux].

DORMONGAL, Charles, *Genèse de Son Altesse le Vin*. 127 p., illustrations. Bordeaux (édition Des Roses), 1931.

[A profusely illustrated and interesting work with chapters on wine in history, wine as a living food and wine and the poets].

DORMONTAL, Charles, *Florilège des grands vins de Bordeaux*. 141 p., illustrations. Bordeaux (édition Des Roses), 1932.

[A study, with map, of the wine country round Bordeaux, treated from a historical point of view. The volume is pleasant reading and gives interesting information about the following wine producing districts :— le Médoc, le Sauternais, les Graves, le St. Emilionnais, la Rive Droite and l'Entre-Deux-Mers]

### FORESTRY

#### Technical measures proposed in regard to the crisis in forest production.

The intensification of the crisis in regard to forest products has been accompanied by a corresponding development of the efforts made in many countries to find ways of relieving the situation of the forest owners. Anxious enquiry has been made as to the best methods of checking the trouble and as to the most timely policy to adopt so as once again to make forestry a profitable concern. It has been generally considered that political and legislative or, in other words, governmental measures

were those best calculated to relieve the plight of the owners and the last number of this Bulletin has already discussed this aspect of the question (1). Since however it is not enough merely to wait for a general strengthening of the forest policy of the State and of the Public Authorities and as the owners should also take all possible steps on their own account to increase the returns from their forest possessions, certain recommendations have also been made as to the action that owners can take themselves directly. If such action, which may be described as technical or silvicultural, and the object of which is to increase and to secure a good yield from the forests, not merely for the time being but also from the point of view of an indefinitely extended future, is considered, it will be seen that it cannot be carried out unless, either previously or at the same time, certain measures of the political order are also adopted. The States which really desire to protect their forests from destruction ought at least so to adapt their forest policy as to make it possible for the owners to carry out their own proper part.

The chief purposes of a technical or silvicultural policy for the improvement of the situation are to secure the highest possible yield from the forests and to obtain on any given area in the briefest period and at the lowest cost the highest possible rate of profit. As a rule however these objects cannot be attained even where the best technical methods are followed, except after a certain interval of time since their effects are not as a rule felt immediately. Certain steps can however be taken which may prove advantageous to the owner of a forest after a relatively short period.

*Extension of the use of natural regeneration after felling.* — This principle of silviculture is among those which it is most desirable to extend, and ROSSEELS (Belgium) is very emphatic as to its value. "Wherever", he says, "the conditions of the soil, climate and stands permit, natural regeneration should be substituted for clear felling with the object of avoiding the heavy cost of reafforestation and of making up the surface". Thus at the same time the costs of production would be considerably reduced. From this point of view the situation is especially difficult in those countries and regions where a large part of the forests consists in conifers under short rotation schemes which cannot be subjected to natural regeneration, since the type of forest stock is not particularly well adapted for this form of treatment. Where expenses cannot be reduced, some means of increasing revenue must be found and the following methods are worthy of note in this connection.

*Change in the type of tree grown through the introduction of different varieties.* — D'ALVIELLA (Belgium) and HEIL (Germany) recommend the introduction of high yielding trees with a strong capacity for growth. BRAGHETTI and DI TELLA (Italy) suggest in addition the increase of returns through the admixture of broad leaved trees with the conifers. The varieties recommended by ROSSEELS for introduction into Belgium and by DI TELLA for introduction into Italy deserve special attention.

Among conifers ROSSEELS mentions in the first place the Japan larch and counsels the planting of seedlings of a full year's growth in sandy soils in combination with Scots pine in the proportion of one to ten. The first named variety has a very rapid growth, even more rapid in Europe than in its native habitat, and combines well with the Scots pine. When it reaches 20-25 years of age it makes standards

(1) Monthly Bulletin of Agricultural Science and Practice, 1932, No 2, pp. 67-71.

from 60 to 80 cm. in circumference, which can be felled without interference with the leafy canopy because of the co-existence of the Scots pines. In this way a supplementary profit can be obtained which has also the substantial advantage that it is not realized at the same time as the profit from the final cut of the Scots pine. The European larch can also be planted with advantage on fair-sized open spaces and should be planted closely so as to provide a useful class of intermediate product.

Dr TELLA recommends as a very effective method of improving the stands a mixture of larch, especially Japan larch, with ordinary broad leaved coppice in the subalpine Lombardy forests.

On poor soils, which formerly were considered as suitable for the Scots pine only, ROSSEELS favours the introduction of the Corsican in place of the Scots pine as a means whereby forest revenues can be materially increased. He refers to stands of Corsican pine in Holland which, on dry sandy soils, at the age of 40 years gave a yield of 440 cubic metres per hectare.

ROSSEELS also refers to the Douglas pine as another conifer which grows quickly and has a high yield. It is however more exacting than the others mentioned, both as regards the good quality and the freshness of the soil and is also liable to damage by game.

Dr TELLA describes certain eucalyptus plantations in Sardinia, which gave at the age of 7 years a yield of 394 cubic metres per hectare, corresponding to an average annual woody increment of 56  $\frac{1}{4}$  cubic metres.

As regards broad-leaved trees, M. ROSSEELS draws attention to the possibilities of introducing the quick growing Canadian poplar, even though it is not generally considered to be a variety specially suitable for growing in normal forest conditions. The plantation of Canadian pine stools in open spaces and at the edges of woods might prove a good source of additional revenue, since and especially in recent years, the timber it produces is in great request as it is useful for a variety of purposes. The white poplar can also be used in the same way, even though it is of less rapid growth and more exacting as to soil requirements. This tree is also of value inside the forest.

Varieties which give but scanty or no yield should be replaced by others of a more profitable character. The chief interest of the private individual consists in obtaining returns at relatively short intervals so that he can personally derive some part of the benefit, and such interest is well served by the judicious choice of suitable varieties.

*Changes in forest system.* — Some change in system is also frequently recommended as likely to serve a useful purpose in the present time of crisis. For example ROSSEELS has pointed out that the growing stands which show the largest volume do not always give the highest return. In this connection periodical measurements might provide some valuable data. It frequently happens that by some reduction or, according to the particular case, by some increase in the woody capital, it may be possible to obtain the highest possible revenue. It would seem that this result may be realised through an extension of the rotation period especially in the case of ordinary coppice. The conversion of coppice or of coppice with standards into high forest might frequently give an increased rate of return more particularly in countries where heavy timbers are most in demand.

The afforestation or reafforestation of suitable wastelands, restocking immediately after clean felling, avoidance of leaving the surface uncultivated, suppression of the removal of dead or live soil-covering, all these are included among the



practical methods recommended by D'ALVIELLA, BRAGHETTA, DI TELLA, etc. as likely to increase forest returns.

*Restriction of fellings.* — Many authorities hold that a diminished exploitation is one of the most effective means for securing an increase in timber prices. At the International Timber Conference held at Prague and at similar conferences at Warsaw and Paris, it has been urged that in Europe there should be a curtailment of felling since there has been some falling off in consumption. BRAGHETTA considers that the fact that in certain countries, now that prices are low, there is now more felling than when prices ruled higher, is a more potent cause of the crisis in forest products than the Russian dumping and that the reversal of such a policy as regards exploitation is the only right course. BAVIER (Switzerland) states that, even in those countries in which forestry is highly advanced, it has been found necessary to reduce exploitation but at the same time points out that this policy must not become exaggerated, for nature will not tolerate any set-back in forestry.

As regards Poland the *Rynck Drzewny* Review holds a similar view but it is also shewn that it is impossible to give full effect to the principle of a restriction of fellings since the owner requires to obtain some return, however small, from his forest property. If he reduces his annual fellings, it is to be feared that the results will be chiefly felt in the most valuable part of the forest and in this way the whole forest situation may be seriously affected.

ERDMANN (Germany) considers that a reduction of fellings can only be regarded as of service when it may be supposed that at the end of a certain number of years either the prices of timber will rise or that wages, taxes and interest will show a distinct fall. As however — so it appears to him — it is impossible to expect that any one of these events will take place, any reduction in fellings might well result, not only in a fall in forest income at the time when the crisis is being most severely felt, but also in a disturbance of the scheme of management as well as in a decrease of increment in the future. Hence a temporary restriction in exploitation can only be justified if there is reason to believe that at an early date it will be possible to redress the balance by a corresponding increase. In present circumstances however such a policy can only be pursued to a very limited degree. It is preferable, he says, to try and find the means for increasing returns as soon as possible and for this purpose he recommends that the method of determining annual yield by area (*Flächenprincip*), the method now very generally in use which only favours the future at the expense of present needs, should be given up in favour of a wise use of the method by volume (*Vorrathsmethod*), which is the more likely to bring about an early increase of yield and of the current mass increment. LEMMEL (Germany) is of the contrary opinion and does not consider that the crisis is likely to last for a long period. He does not look for any rapid increase in prices as the result of customs duties or credits for forestry, but believes that more can be expected from the diminution in the costs of production, which is an urgent necessity. With any recovery in production high rates of wages, which even now are only maintained at the cost of unemployment, cannot long continue. Under the pressure of fixed economic law present conditions must change sooner or later and high wages and high fiscal charges are bound to fall. Thus according to LEMMEL the recommendation of ERDMANN, which effectively amounts to the advocacy of increasing fellings, is inopportune at the present time, and would not be entirely justified even if it were certain that the crisis would prove a long affair, since the increase in fellings could not fail to affect prices unfavourably.

ERDMANN further suggests that it might be possible to increase forest yields

by leaving out of account, at any rate for the time being, those sections which are entirely or largely unproductive and believes that by thus diminishing the area regularly worked, the extent of the annual fellings could be augmented. LEMMEL holds that this recommendation of ERDMANN is even less timely than the first. He compares the forester, who would put out of action certain sections of his working area, to a manufacturer who, in order to cut down his business, sells or scraps some part of his workshops and plant. Such a course cannot but be retrogressive and lead to falling off in production, loss of capital and rapid general impoverishment.

*Maintenance of the forest soil in good condition.* — The value of this precaution from the point of view of relieving the crisis is very generally recognised and methods of cultivation and the careful choice of varieties are of great importance in this connection. ERDMANN urges that every effort should be made to obtain all possible benefit from the soil and thus to secure a production which is superior both qualitatively and quantitatively, an object that can only be achieved by constant attention throughout the whole period of the life of the stands.

*Methods of management and cultivation.* — GEHRHARDT (Germany) is strongly of opinion that the method of forest management which gives the best yield and should be considered as essential in the public economic interest is that which proceeds by way of a pronounced gradation of the thinnings. GEHRHARDT and HEIL (Germany) are agreed on this point and quote the example of the thinning methods adopted in the privately owned forests in Denmark as particularly instructive as indicating the means which have enabled the Danish forests to obtain increments and yields so remarkable that they have attracted the special notice of all forestry experts. These two authorities point out that the reason underlying the remarkable standard of production shown by these forests does not lie so much in the climatic and other local conditions as in the methods of forest management and treatment of the soil. In Danish forests the thinning process begins, when the stands are from 15-20 years old and is repeated, in accordance with the particular scheme adopted, every two or three years in the first instance, and then every 4-6 years in the stands of middle age and every 6-10 years in the more mature high forest.

The principle of heavy thinnings has the great advantage that it facilitates the production, within a relatively brief period, of strong and valuable timber. The annual rings, as the result of careful and regular methods of cultivation, are of an even thickness from the earliest to the most mature age so that at any time there is a good supply of readily saleable wood. Stands thus treated become resistant to wind and snowbreaks and to the attacks of insect and other pests. The volume of production is increased and often also the importance of the by-products, which sometimes prove even more valuable than the actual fellings.

As a complement to the policy of heavy thinnings which he supports, GEHRHARDT further recommends that each thinning should be accompanied by suitable clearings and trimmings. In order to have a clear idea of the economic value of the methods thus advocated it is only necessary to consider the difference between timber which is only stripped of its branches and timber which is also at the same time free from internal knots. Such timber will always be in great demand and can only be obtained if the stands are treated in the manner proposed.

*Standardisation of forest products and of silvicultural methods.* — The adoption of the principle of standardisation is also considered by many authorities as likely

to prove of great value in dealing with the economic crisis. A unified system of the measurements used in the timber trade would be of first rate importance in this connection. The persons directly interested, and more particularly the producers, can only obtain the desired result through international agreements made between a number of countries involving governmental intervention, in other words political action will be necessary in the first place. According to a statement by PELLETER (Austria) the advantages of standardisation would be very far-reaching and save producers from much serious loss. For example it frequently happens that the owner of a forest who at the time of felling does not as yet know the country in which his timber will be marketed, may lose a considerable amount of his product when, after sawing according to certain dimensions, he is required to sell it according to some other standard. It may also happen that a producer may delay delivery, because he is forced to adopt some new or special measure or is obliged to make a fresh felling to meet the required standard and to consign his timber before it is properly dry. It is clear that standardisation would obviate this class of difficulty. At the same time it would greatly reduce the costs of production since the woodmen would be working to fixed measurements and thus the risk to the owners would be diminished while their capacity to hold their own on a competitive market would be increased. It is obvious too that the standardisation of timber lots would also be advantageous on the home market.

PELLETER is also in favour of the adoption of certain standard rules in forest accountancy and book-keeping, stock taking, reports on working schemes, loading, storage, wages, working plans, transport arrangements, organisation of forest services, as also in timber factories, sawmills, etc. Organisation on these lines would tend to marked improvement on the technical side.

*Scientific management*, suitably applied, is really essential for forestry and it is gradually becoming realised that it will never be possible to get the better of the crisis and of the prevailing unemployment by any return to earlier cultivation methods. Furthermore rationalisation involves less risk for forestry than for agriculture as the machinery element is of much less importance in the former than in the latter. STREHLKE (Germany) shows that the relatively small number of workers that might be discharged in consequence of scientific management in forestry work could be readily absorbed elsewhere.

Technical and practical measures are rightly the business of the forest owners themselves but the owner is able to carry them out only if he is supported by a sound State forestry policy. Since moreover, as BAVIER says, excessive exploitation of the forests leads sooner or later to a complete shortage of timber, those States which are able, even at the cost of heavy sacrifices, to check the destruction of their forests, to devote special attention to their requirements and to secure their continuous existence through advanced silvicultural methods, cannot fail to reap their reward in the future.

G. LUNCZ

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# MONTHLY BULLETIN

OF

## AGRICULTURAL SCIENCE AND PRACTICE

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No. 4

### GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

#### Miscellanea.

#### GENERAL AGRONOMY.

#### Meteorology.

**PROTECTION OF ORCHARDS FROM FROST IN CALIFORNIA.** — Frost is one of the worst enemies of the fruit grower. A sudden fall in temperature may in a few hours ruin a whole crop, and even countries with warm dry climates are not safe, because cold caused by nocturnal radiation from the ground is as harmful as more general low temperatures and is the cause of losses of millions of dollars every year in California.

California fruit growers have thus found it necessary to seek means of protection against frost caused in this way. Nocturnal frosts from ground radiation are produced in the following manner. In sub-tropical countries the intense diurnal solar radiation heats the ground which in turn heats the lower strata of air; the heated air is lighter and rises, thus warming the atmosphere up to a certain height. At nightfall solar radiation gives place to terrestrial radiation which, though less intense, causes a serious loss of heat; the ground becomes cooled and the air in contact with it cools by simple conduction so that a cold layer is formed below less cold strata. This inversion of temperature creates conditions that are most dangerous for plant growth.

Dryness of the atmosphere aggravates the danger. In wet regions the moisture of the atmosphere checks terrestrial radiation of heat and its nocturnal loss, and moreover condensation of water vapour and subsequent freezing liberate a considerable number of calories on the surface of the ground. On the other hand in semi-arid regions in which the sky is usually clear, frosts due to radiation are frequent and all the more dangerous because the daytime heat activates growth and thus makes plants more sensitive to accidents of weather.

The following methods of protection have been tried:

(1) To hinder nocturnal terrestrial radiation certain fruit growers have attempted interposing protective screens between the trees and the atmosphere above; but, to obtain satisfactory results continuous screens are necessary, for radiation may cause dangerous cold in the gaps; moreover such an installation would be costly and difficult to manage.

(2) Other growers have attempted to take advantage of the heat produced by condensation of water and have sprayed jets of steam among the trees. But freezing of the condensed water may overburden and break the branches, so that this method has more drawbacks than advantages. Irrigation of the ground during frost however results in a humidity which on solidification liberates a certain amount of heat. Unfortunately water is scarce and costly in semi-arid regions, also the sun's heat must first melt and evaporate the water, so that the orchard will become less heated during the day and thus less able to support further frost.

(3) The only really satisfactory method and the one that is in general use in California is the production of heat by a large number of small fires in and around the orchard. The heating of the orchards is facilitated by the fact that the layer of air to be warmed is relatively thin owing to the inversion of temperature.

There is on the market a wide variety of stoves of 2 main types, the one burning heavy oil (Diesel oil) and the other solid fuel in the form of coke briquettes or balls of compressed rite waste treated with paraffin. The use of the first type of stove is widely spread in California, a country which is a large producer of cheap petrol. The solid fuel stoves have however a number of supporters specially since their draught has been improved by the supply of uniform briquettes. The calorific power of these stoves

is about half that of the oil stoves, but they have the advantage that their fuel is more easily transported and stored. Both systems have good and bad points and the price of the fuel and of the manipulation of the stoves must guide the grower in his choice.

In résumé, the problem of frost control is highly complex and must be approached in different ways according to the nature of the district requiring protection. To assist in the choice of type of stove there are the results of experiments carried out by Prof. HOFFMANN at the University of Berkeley, California, with a view to obtaining a convenient and economic stove producing cheaply and continuously a constant heat during the period of danger, utilising to the full the calorific power of the fuel by drawing in the greatest quantity of cold air, not giving out excessive horizontal radiation, nor emitting gases which rise too rapidly to warm the trees and producing a minimum of disagreeable or injurious smoke. (P. DUBOIS, *La vie agricole et rurale*, Paris 1931, N. 43, pp. 260-261).

T. B.

### Soil Science.

**STONES WHICH GROW IN THE GROUND.** — It appears to many a farmer as if stones grow in some way in the ground, for each year they are removed and each year there are as many as ever. In this form of course the idea is absurd, the stones appearing each year being already formed and merely brought to the surface by the action of frost and erosion, cultivation, etc.

But the idea that an actual formation of stones takes place in the soil is not at all absurd. But such formation must be related to the movement of underground water, which is in general downwards in wet climates during at least the greater part of the year, and upwards in arid climates.

*Stones formed by downward moving water.* — In the subsoil of many soils there frequently occur calcareous rods of the size of a pencil, with the axis formed of brownish organic matter which is the remains of a root which has acted as a core for the accretion of lime dissolved in the soil water. The same mechanism probably accounts for the formation of the 'puppets' in loess, which are rounded lumps of a calcareous deposit measuring from a few centimetres to over a metre in length. Sometimes these calcareous 'puppets' become combined into a conglomerate which forms irregular slabs making a subsoil impermeable to water and impenetrable to roots.

In sandy soils lacking lime but rich in acid humus the latter becomes dissolved in the downward moving water and deprives the subsoil of its soluble inorganic elements, particularly iron, and transforms it thus into an ash-coloured earth known in Russia as 'podsol' and in Germany as 'Bleicherde'. The iron humate penetrating deeply into the soil precipitates oxide of iron which binds the sand grains forming ferruginous accretions or beds of a brown impermeable sandstone, impenetrable to roots, called 'iron pan' in England, 'alios' in France and 'Ortstein' in Germany. This formation is frequent in Russia, in Northern Germany and in Gascony, where the impermeable pan is liable to form marshland.

*Stones formed by upward moving water.* — In North Africa slow evaporation of subterranean water a short way below the surface causes the formation of a crust in many regions, particularly in Tunisia, where the slabs are often from 10 to 20 cm in thickness and contain 80-90 % of lime. When they are broken by means of explosives or, better still, removed, the productivity of the soil is greatly increased by giving the roots access to the subterranean water.

In Southern Algeria, near Touggourt, there are found in the sand at a depth of a few centimetres pretty stones called 'sand roses', which are rosettes of gypsum crystals formed by the slow and continuous evaporation of water with a high concentration of calcium sulphate.

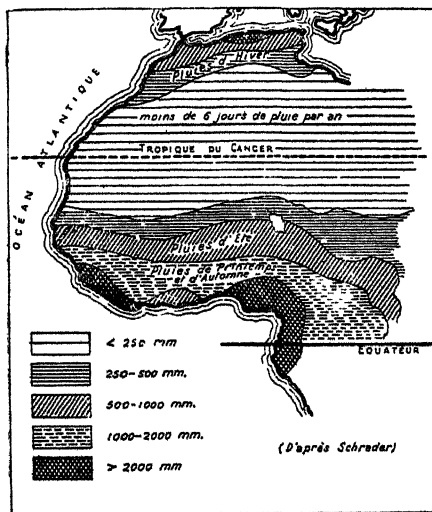
Thus from these facts it appears that certain stones are to-day forming in the soil and subsoil, but not those that are observed on the surface of fields. (*La Potasse*, Mulhouse 1932, N. 49, pp. 39-41).

**RELATIONSHIP BETWEEN SOIL PH AND RAINFALL IN FRENCH AFRICA.** — The hydrogen ion concentration of a soil is the result of an equilibrium between its acid and basic elements and the reactions which produce it take place in the presence of water, the latter playing a principal rôle, particularly in the form of rain water.

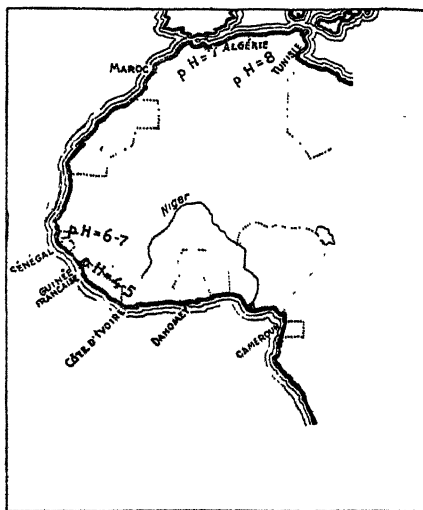
If water is penetrating the soil in abundance and is frequently renewed, considerable quantities of soluble basic elements are dissolved, so that the soil becomes more acid, its pH becoming less than 7. If water is less abundant only the most readily soluble elements such as lime are eliminated and the soil pH is maintained at about 7.

(neutrality). If water is still scarcer, evaporation exceeding precipitation, the soil solutions tend to rise and to crystallise out the dissolved salts, the soil thus becoming richer in basic elements till the pH is about 8.

These phenomena are particularly marked in a vast region with striking differences in climate such as French Africa, which extends over several thousand kilometres from the coasts of Algeria and Tunis to the Gulf of Guinea.



French Africa :  
Distribution of rainfall.



French Africa :  
Distribution of pH values of soils.

To account for the distribution of rainfall in this region 2 main facts must be taken into consideration : (1) that the Tropic of Cancer runs across the middle of the region from east to west, corresponding to a zone of low rainfall bounded on the north and south by more humid zones ; (2) the presence of the Atlantic Ocean on the west of the region, from which come the moist winds which water the whole region. Zones with differing degrees of rainfall thus result and correspond with well-defined pH zones, as follows :—

(1) the north-west zone (Western and Southern Morocco and the northern part of the Department of Oran and Algiers), relatively humid with a temperate climate ; the soils of this zone are approximately neutral (pH about 7) ;

(2) the low rainfall zone on both sides of the Tropic, where evaporation greatly exceeds the annual precipitation (Southern and Eastern Morocco, part of the Department of Constantine, the greater part of Tunisia and probably also of the Sahara) ; alkaline soils (pH about 8) in which there is a tendency to the formation of calcareous crusts ('tufts') or gypsum 'sand roses' ;

(3) the summer rainfall zone with medium precipitation (500-1000 mm), situated to the south of the preceding zone (Senegal and Sudan), in which the soils are neutral or slightly acid (pH = 6-7) ; this is a savannah region with scrub growth, where the rainfall is not sufficiently abundant or continuous to allow of a forest vegetation ;

(4) to the south of this zone is found that of heavy rainfall distributed over a large part of the year ; in the regions directly exposed to the warm moist wind coming from the west (French Guinea, the Cameroon coast) the rainfall exceeds 4000 mm. per annum ; this is a zone of forest soils or acid marshes (pH = 4-5) ; on the other hand, the Ivory Coast which is partly protected from the moist west winds by the mountains of Guinea, has in addition to acid soils certain neutral or alkaline soils characteristic of medium rainfall.

These facts show that in French Africa the distribution of soil pH is closely correlated with that of rainfall. This influence of climate on pH greatly exceeds that of the geological subsoil which would at first sight appear to exert the dominating influence, but the subsoil has a marked effect on the pH of the soils forming on the surface of the mother rock which is being constantly denuded by erosion or the plough ; its effect is

non-existent however in soils which have over a long succession of years been submitted to the influence of the same climate. (J. F. DE FERRIERE, *La Potasse*, Mulhouse 1932, n. 49, pp. 37-39).

**RAPID METHOD FOR DETERMINING THE OXIDISING POWER OF SOILS.** — It is now recognised that the greater the capacity of a soil for oxidising and thus transforming organic matter into compounds available to plants, the more may it be regarded as good soil from an agricultural standpoint.

Taking this principle as a starting point M. A. CURINI GALLETTI of the Agricultural Experiment Station of Modena, Italy, has sought a simple and rapid method which will with a little practice allow of a visual appreciation of this important property of soils which is an index of fertility. He has found a colorimetric method utilising as reagent benzidine or paradiaminodiphenyl ( $\text{NH}_2 \text{C}_6 \text{H}_4 - \text{C}_6 \text{H}_4 \text{NH}_2$ ) in the following manner. On a large watch glass (about 8 cm in diam.) is placed 1/2 gram of well-dried soil, previously ground and sifted through a 5 mm mesh, and 2 cc. of an aqueous solution of benzidine are added and the watch glass is slowly revolved. After half an hour the reaction can be detected. The soil in accordance with its oxidising capacity acquires a coloration varying from dark blue to blue green and (lower limit) to a very pale, scarcely appreciable, blue.

According to the writer, with a little practice evaluation is easy and the method has given satisfactory results. To obtain the aqueous solution of pure benzidine he dissolves 2 gm in a litre of boiling distilled water, leaves the solution to cool for 24 hours and then filters. The solution keeps well. (*Annali di Chimica applicata*, Roma 1932, Vol. 22, Fasc. 2, p. 81-83).

T. B.

#### Fertilisers and Fertilising.

**WORLD PRODUCTION AND CONSUMPTION OF NITROGENOUS FERTILISERS FROM 1926 TO 1931.** — The last annual report (1930-1931) of the British Sulfate of Ammonia Federation estimates the world capacity of production of pure nitrogen at 3 million metric tons, not including Chili saltpetre. For the same fiscal year (terminated 30 June 1931) the report estimates an effective world production of pure nitrogen (including Chili saltpetre) at 1,694,288 tons, a reduction of 23 % on that of the preceding fiscal year; on the world consumption of pure nitrogen it estimates a reduction of 17 % as compared with the previous year.

The figures shown in the following table are presented in the report as approximate values without pretension to absolute accuracy.

*World production and consumption of pure nitrogen (in tons) from 1926 to 1931.*

	1926-27	1927-28	1928-29	1929-30	1930-31
<b>Production :</b>					
Artificial nitrogenous products . . . . .	1 122 900	1 334 000	1 623 000	1 739 540	1 444 288
Chili saltpetre . . . . .	199 600	390 000	490 000	464 000	250 000
Total production . . . . .	1 322 500	1 724 000	2 113 000	2 203 540	1 694 288
<b>Consumption :</b>					
Artificial nitrogenous products . . . . .	1 091 177	1 249 669	1 452 630	1 536 904	1 377 005
Chili saltpetre . . . . .	275 158	392 722	419 460	368 893	244 300
Total consumption . . . . .	1 366 335	1 642 391	1 872 090	1 905 797	1 621 305
Agricultural consumption (approx.) . . . . .	1 200 000	1 490 000	1 684 000	1 750 000	1 455 000

**NEW PHOSPHORITE BEDS IN THE TRANSVAAL.** — Extensive deposits of high value phosphorite, greatly superior to any previously known in South Africa, have been discovered at Palabora in north-eastern Transvaal. It is expected that a fertiliser industry will arise, capable of supplying in the near future the requirements of South Africa in  $\text{P}_2\text{O}_5$  and even competing with the export trade of the phosphate producing regions of North America, Egypt, Tunisia, Algeria and Morocco. (*The American Fertiliser*, Philadelphia 1932, Vol. 76, No. 4, p. 38).

**SOLUBILISATION OF INSOLUBLE PHOSPHATES BY SOIL MICRO-ORGANISMS.** — With a view to the possible utilisation of the phosphates of natural limestones M. O. VERONA (Higher Agricultural Institute of Pisa, Italy) has considered it of interest to determine

the comparative behaviour of the micro-organisms contained in 3 plots of the same soil in which for 3 consecutive years have been grown plants belonging respectively to the Leguminosae (bean), Graminaceae (wheat) and Cruciferae (*Diplotaxis erucoides* D. C.).

The number of microbes in the immediate vicinity of the roots of these plants was first determined and it was found that in 1 gm of soil there were 1,350,000 near the Leguminous plant, 1,020,000 near the Graminaceous plant and 870,000 near the Cruciferous plant, thus by their decreasing order bearing out previous ideas on the subject.

Tests of the solubilisation of tricalcium phosphate were made by inoculating a suitable medium containing  $\text{Ca}_3\text{P}_2\text{O}_8$  with 1 gm of soil coming from each of the three plots. The quantity of dissolved  $\text{P}_2\text{O}_5$  in equal portions of the medium was determined periodically and the following results were obtained :—

	Quantities of $\text{P}_2\text{O}_5$ dissolved by the microbes		
	With soil from a Leguminous plot	With soil from a Graminaceous plot	With soil from a Cruciferous plot
At the beginning . . . . .	traces	traces	traces
After 5 days of culture . . . . .	0.0412 gm	0.0412 gm	0.0357 gm
» 10 » » » . . . . .	0.1071 »	0.0629 »	0.0750 »
» 15 » » » . . . . .	0.0383 »	0.0346 »	0.0342 »
» 20 » » » . . . . .	0.0288 »	0.0168 »	0.0386 »
» 25 » » » . . . . .	0.0128 »	0.0166 »	0.0222 »

These results show that :—

(1) During the first 10 days solubilisation of  $\text{P}_2\text{O}_5$  was greatest in the cultures containing the bean soil and nearly equal in the other two, though slightly superior in the Cruciferous.

(2) After 15 days solubilisation was approximately equal in all three cultures.

(3) From the 20th day the quantity of dissolved  $\text{P}_2\text{O}_5$  was constantly superior in the cultures inoculated with the Cruciferous soil, while it remained stable in the case of the wheat soil and dropped behind the other two with the bean soil.

These results confirm the fact established by C. RAVENNA and M. ZAMORANI (*Le Stazioni sperimentali agrarie italiane*, Vol. XLII, p. 389) that Cruciferous plants utilise tricalcium phosphate better than the Graminaceae and Leguminosae, and demonstrates once more that the solubilisation of natural phosphates by soil micro-organisms depends also on the crop grown. (P. VERONA, *Alcune esperienze sulla solubilizzazione micrororganica dei fosfati insolubili*, *L'Italia agricola*, Piacenza 1931, Anno 68<sup>o</sup>, N. 12, p. 957-958).

**ACTION OF IODINE AND POTASSIUM IODIDE IN THE NUTRITION OF SOIL, MICRO-ORGANISMS.** — MM. O. VERONA and C. FERRETTI (Higher Agricultural Institute, Pisa) have obtained the following experimental results :—

As regards the action of iodine fertilisers on the higher plants experiments have up to the present yielded no directly beneficial results and most frequently the results have been negative (see this *Bulletin* 1932, No. 1, p. 6).

But as regards its effect on micro-organisms the following interesting results have been obtained :—

(1) The chemistry of the bacterial cell derives benefit from moderate supplies of iodine or potassium iodide added to the nutrient medium.

(2) To more highly evolved organisms such as fungi such additions may in certain cases be useful, in others harmful, and in others again may be without effect. Iodine is more toxic to fungi than to bacteria; smaller doses become mortal to the former than to the latter. Resistance to iodine varies also in different species of fungi.

(3) In organisms still more differentiated such as algae, iodine or potassium iodide is beneficial only in minute doses. Large quantities have rapid toxic effects.

(4) In general iodised fertilisers promote biochemical activity in the soil, particularly the processes of nitrification and solubilisation of inorganic elements.

(5) Iodised fertilisers promote also amylolytic activity of micro-organisms.

In résumé, the action of iodine varies with the degree of evolution of the organisms to which it is applied: in equal doses it may be useful to lower organisms and injurious to higher organisms. This fact explains the lack of success in applying iodine fertilisers to crops. (O. VERONA and C. FERRETTI, *L'azione oligodinamica dello iodio e dello ioduro*

potassico nella nutrizione dei microrganismi del terreno agrario. Pisa 1931, R. Istituto Superiore Agrario, Laboratorio di Patologia vegetale e di Batteriologia agraria, Pubblicazione N. 33).

T. B.

\* \* \*

## II. — CROPS OF TEMPERATE REGIONS.

INVESTIGATIONS ON THE WATER CONSUMPTION OF DIFFERENT GRASSES. — By experiments lasting over 5 years (1924-1928) undertaken at the 'Institut für Pflanzenbau und Pflanzenzüchtung' of the University of Giessen in collaboration with the 'Institut für Grünlandwirtschaft' at Landsberg a. W. it was intended to extend our knowledge regarding the water consumption of various grasses. The experiments were carried out in a specially built set of tanks with a lysimeter for measuring loss of water. The following table gives the average of the main results for the last 4 years of the experiment:

Species	Number of days of growth	Yield of hay in 100 kg. per ha.	Number in order of increasing yield	Percentage content in dry matter	Percentage content in raw protein	Consumption of water in mm.	Number in order of increasing consumption	Daily consumption of water in mm.	Consumption of water per kg. of hay	Number in order of increasing consumption
Reed-grass ( <i>Phalaris arundinacea</i> ) . . . . .	178	110	7	89.5	12.2	537	7	3.29	535	7
Rye grass ( <i>Lolium perenne</i> ) . . . . .	177	97	8	89.6	10.6	460	1	2.59	474	1
Cock's-foot ( <i>Dactylis glomerata</i> ) . . . . .	178	106	6	89.2	10.5	530	6	2.98	501	5
Fescue ( <i>Festuca pratensis</i> ) . . . . .	176	99	4	89.3	10.8	469	2	2.66	474	2
Timothy ( <i>Phleum pratense</i> ) . . . . .	178	103	5	89.7	7.9	505	4	2.83	489	4
Footail ( <i>Alopecurus pratensis</i> ) . . . . .	178	93	1	89.2	12.4	513	5	2.88	558	3
French rye grass ( <i>Avena elatior</i> ) . . . . .	179	123	3	90.2	8.5	590	3	3.35	485	3
Meadow grass ( <i>Poa pratensis</i> ) . . . . .	179	93	2	89.7	11.0	487	3	2.72	523	6

It is noteworthy that rye grass has the lowest consumption of water and also the lowest consumption of water per kilo of hay and that the second place is occupied by fescue, although both are generally considered as water-loving grasses.

Without giving further details of the behaviour of the different grasses in the experiments the following facts can be stated in relation to the water consumption:—

Increasing yields result in an increasing consumption of water and *vice versa*.

With increasing yields the consumption of water necessary for the production of 1 kilo of hay decreases.

Also decreasing yields, produced by antedating the cutting, cause a decreasing consumption of water per kilo of hay. Thus cutting in an early stage of development is a water preserving measure, and for the same reason pasture, if adequately grazed, consumes less water than does a hay meadow.

The lowest consumption of water for 1 kilo of hay occurs both in the first and in the second cutting in different years and seems to be principally dependent on the date of cutting.

The highest consumption of water for 1 kilo of hay is always to be found in the third cutting.

The highest daily consumption of water does not occur in the periods which excel in the highest yields of hay. The highest yields occur mostly in the first period of growth the highest daily consumption of water is to be found in the second period, during which the atmospheric conditions of the summer promote evaporation. On the whole the atmospheric phenomena have such a dominating influence on the consumption of water as to disguise the influence of the actual growing stage of the grasses. Even the influence of the rapidly developing flowers on the consumption of water is completely concealed by the dominating effects of weather conditions (R. SCHWARZ, *Archiv für Pflanzenbau*, Berlin 1932, Vol. VIII, p. 276-334).

N. G.

INFLUENCE OF ALTITUDE ON TUBER FORMATION IN THE POTATO. — Experiments have been carried out by M. P. LEBARD in France to determine the influence of altitude on tuber formation. Similar plots of potatoes were grown in low-lying land at



Grenoble (214 m), and in the mountains at La Grave (1500 m), Villar d'Arène (1650 m) and Lautaret (2100 m.). Two varieties were grown. 'Bevelander' and 'Imperia', the former being immune from mosaic diseases, the latter susceptible to simple mosaic. To give comparable results tubers of equal weight were selected within each variety, and after germination in the light those with an equal number of perfectly developed shoots were selected for planting. Planting was carried out on 20 May at Grenoble, La Grave and Villa d'Arène and on 8 June at Lautaret on account of the climate; control plantings were made also at La Grave on 8 June.

The average yields per plant given in the following table were estimated from 6 normally developed stools.

*Mean yields of tubers per plant at termination of growth.*

Varieties	Planted 20 May			Planted 8 June	
	Grenoble (214 m.)	La Grave (1500 m.)	V. d'Arène (1650 m.)	La Grave (1500 m.)	Lautaret (2100 m.)
Imperia . . . . .	1285 gm	2320 gm	1406 gm	—	—
Bevelander . . . . .	1240 "	2089 "	—	1020 gm	559 gm

These results show that the yield is higher at an altitude of 1500 m (La Grave) than in the lowlands (Grenoble), but it falls again at an altitude of 2100 m ('Bevelander').

Thus an alpine climate favours tuber formation, but for fields planted at the same date at progressively increasing altitudes there exists an optimum altitude above which the yield falls off. (*Comptes rendus de l'Académie des Sciences*, Paris 1932, tome 194, n. 2).

**ARRESTED GROWTH OF POTATO SPROUTS CAUSED BY VOLATILE SUBSTANCES OF APPLES.** — O. H. ELMER, working at the Kansas Agricultural Experiment Station, has found that the volatile substances given off by ripe apples prevent the normal development of potato sprouts.

Tubers planted in pots in conditions favourable to growth uniformly produced abnormal sprouts if kept in a closed room containing ripe apples. The terminal growth of the shoots was practically stopped and small stem tubers developed in place of normal shoots. This arrested growth was observed with the 6 following varieties of potatoes: — Irish Cobbler, Bliss Triumph, Russet Burbank, Spaulding Rose No. 4, Early Ohio and one unidentified variety. The effect was produced by Winesap, Stayman, Jonathan and Ben Davis apples and was equally marked whether the apples were peeled or not. It was not found that the volatile substances of oranges, bananas or overripe apples had a similar effect. Green apples caused no check to growth, but the same apples when ripe did. The effect was temporary and normal development set in again as soon as the potatoes were removed from the influence of the apples.

In a previous experiment it was found that potatoes stored until June in closed chambers with apples kept firmer and better than the control potatoes. (*Science*, Garrison-on-Hudson, U. S. A., 12 February 1932).

**WEIGHT OF SUGAR BEET AS A FUNCTION OF THE HOURS OF SUNLIGHT DURING GROWTH.** — Experiments have been carried out over some years in Holland by M. A. L. VAN SCHERPENBERG to determine the influence of the number of hours of insolation during growth on the weight of beet roots. He has obtained the following formula:—

$$P = (a + b) \times S$$

where P = weight of roots per ha, S = hours of insolation and *a* and *b* are empirical coefficients obtained by observation of sugar beet crops in the Netherlands.

If further experiments in other countries enable the values of *a* and *b* to be fixed the formula will make it possible to reckon easily the yield of a field of beets as a function of the hours of sunlight received by the growing crop. (*La Betterave*, N. 549, octobre 1931).

**AN EARLY MATURING DWARF VARIETY OF HEMP.** — In the *Italia Agricola* (January 1932) Prof. O. MUNERATI gives an account of some investigations which were suggested by an article of Dr. SEREBRIAKOVA, published in 1927 in the *Bulletin de botanique appliquée* of Leningrad, describing a dwarf hemp (*Cannabis sativa*) from the north of European Russia, which is very early maturing.

Prof. MUNERATI considered that this new type differing so greatly from that cultivated in Italy was worth studying and determined to investigate the following questions :—

(1) Will the type become modified with time when introduced into an environment so different from its home? It is generally believed that hemp degenerates rapidly but often it is more a matter of crossing with a local type, because pollen grains of hemp are very light and can be carried over long distances.

(2) How will the Russian type behave when crossed with the Italian giant variety? When it is considered that a whole plant of the Russian type does not exceed in height a single leaf of the giant variety it may be realised that a more striking contrast could not be found.

(3) How will the Russian type behave when parasitised by the broomrape which will exceed it in height?

(4) How will the Russian type behave under the influence of continuous illumination (artificial light during the night)?

The following answers to questions (1), (3), (4) were obtained :—

(1) *The type to the 6th generation.* — From 1928 up to the present time, with two crops a year, the type has fully retained the characteristics of dwarfness and early maturity. It will be interesting to see how it will behave in future generations.

(3) *Behaviour of the dwarf type in relation to broomrape.* — Dwarf size would in itself be a disadvantage to a plant attacked by broomrape but as dwarfness is associated with early maturity the rapidity of development of the hemp enables it to compete successfully with the slow-growing parasite. Thus it appears that broomrape causes no harm to the dwarf early hemp.

(4) *Behaviour of the dwarf type when exposed to continuous illumination.* — The hemp did not flower.

*PIROCYDONIA CLARACI* L. D., A NEW GRAFT HYBRID BETWEEN THE PEAR AND THE QUINCE. — Two types of 'graft hybrids' between the genera *Pirus* and *Cidonia* are already known. These are *Pyrocydonia Danicli* and *Pyrocydonia Winkleri*. These two forms are sterile and grow to a smaller size than the quince. *Pyrocydonia Danicli* grows from the callus of a Beurré William's grafted on the common quince. *Pyrocydonia Winkleri* grows at about 7 cm from the callus on a root of a quince stock worked with Beurré Royal.

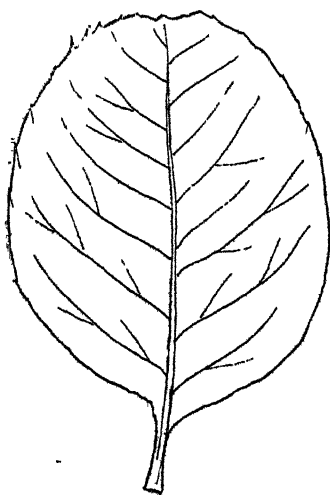


Fig. 1.

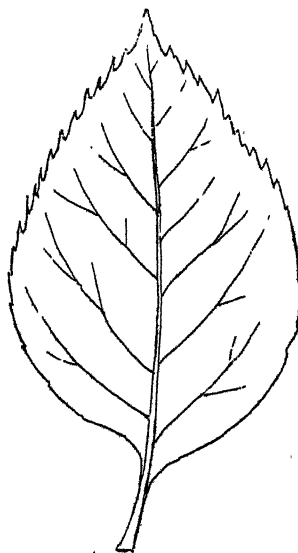


Fig. 2.

In 1929 a new *Pyrocydonia* was discovered by M. CLARAC on the callus of a twenty years old graft of Beurré William's on common quince. The leaf shown in fig. 1 is oval, obtuse and scarcely appreciably dentate; the second leaf (fig. 2) more resembles a pear leaf, acutely dentate in the upper half, pointed and in colour like that of the pear.

This new form of *Pyrocyclonia* is distinguished from *P. Danieli* by two important characteristics, namely it has much greater vigour and apparently may be grown from cuttings. Cuttings of this plant would form the best rootstock for pear varieties which show incompatibility with the quince. (L. DANIEL, *Comptes rendus de l'Académie des Sciences*, Paris 1932, Tome 194, N. 1, p. 30-32).

D. K.

## TROPICAL AND SUBTROPICAL AGRICULTURE

### Sesamum.

Sesamum has always been amongst the most important of the oil yielding plants. Of recent years however the demand for sesamum seed and oil has been steadily declining owing to the increase on the market of oils from other plants such as the oil palm, copra, and the groundnuts. The cultivation of sesamum continues however to be of importance to a large part of the population in countries with tropical and temperate climates. In view of the difficulty in finding full information about the crop, its culture and its commerce it would appear to be of use to indicate certain publications which supply a number of interesting details. The greater part of the facts given below were obtained from the books of VON SPRECHER and DEL NERO and from the articles of EBERHARDT, CASTALDI, and DE TYSSONCK.

BOTANICAL ASPECTS. — *Sesamum indicum* D. C., belongs to the small family of the Pedaliaceae which contains herbs with bluish-green, simple, opposite or alternate leaves provided with mucilaginous hairs.

LINNAEUS distinguished two species:— *Sesamum indicum* L. and *S. orientale* L.; DE CANDOLLE combined them into a single species, *Sesamum indicum* D. C.

The plant is an annual reaching usually a height of about 5 feet. In India however it may reach double that height and have stems the thickness of an arm. The stem is straight, square in section, branching a certain number of times. The leaves are polymorphic, dentate or entire; the lower leaves are sometimes ternate. The flowers are in the axils of the leaves. Of the 3 flowers usually only one develops; the corolla is bi-lobed; only 4 of the 5 stamens develop. The colour of the flower varies in different varieties. HOWARD distinguished 4 colours:— deep violet, white tinged with violet, white with violet margin and pure white. Flowering is from the base of the stem upwards and of short duration. About twenty flowers open each morning and are withered by mid-day.

The fruit is an oblong, bi-locular capsule, each loculus being subdivided by a false septum. It is septicidal and splits downwards from the top leaving the central wall with the seeds free. The seeds are very numerous, oval and flat. The colour varies; according to EBERHARDT the same variety will give lighter-coloured seeds in low land than in the mountains. The seed coat encloses an embryo with clearly distinguishable cotyledons and radicle. Albumen is little developed.

Microscopical study of the seeds shows that the cells of the epidermis contain on the outer side a crystal of calcium oxalate and a pigment on the inner. The cells of the albumen and embryo contain oil and starch grains.

VARIETIES. — It has already been mentioned that the shape of the leaves and the colour of the flowers and seeds are variable. All these variations are affected by climate, soil and cultural treatment. It follows that in introducing seed from a country known for its high yield there can be no certainty of the good qualities being reproduced unless the climate and soil of the new country correspond to those of the country of origin.

At Tatkon in Burma selection work has been begun and 175 types of sesamum have been isolated and reproduced without cross pollination. It was observed in the course of the selection work that varieties with a marked tendency to branching

are more resistant than those with a less branching habit. In Asiatic Turkey for a number of years preference has been given to certain so-called varieties, which are in reality only phenotypic modifications, amongst which the best are the 'Cassaba' and the 'Aidin'. In British India the following variations may be distinguished :—

(1) 'Suffed-til' or 'vel-ellon', with a light-coloured seed. This variety is grown on flood land in the plains; it yields a fine, clear oil.

(2) 'Tillee' or 'per-ellon', with a black seed, is grown in the higher regions. It has the highest oil content and so is preferred for cultivation. The greater part of the Indian oil, which is always slightly cloudy, comes from this variety.

(3) 'Kala-til' or 'kour-ellon', with a reddish seed, is the sesamum of the red soils; the oil is of inferior quality but the variety is somewhat widely cultivated because it will grow on poor, dry soil where the other two varieties will not succeed.

The natives of Java distinguish two varieties :—

(1) The 'widjen sapi', with a cylindrical stem, narrow leaves and brown seeds;

(2) The 'widjen kebo', with a stem square in section and black seeds.

ORIGIN, HISTORY, NAME. — The name sesamum comes to us from the Semitic peoples. It is probable that the 'Open, Sesame' of the 'Arabian Nights' is a reference to the sesamum capsule which until ripe will not open. The crop was thus known to the Arabs; but it comes from much further afield, from India and the Sunda Islands. From India sesamum was introduced into the region of the Euphrates; HERODOTUS, and later STRABO mention the existence of the plant there. On the other hand, according to VON SPRECHER, the sesamum was not known in ancient Egypt. The Jews must have imported it from the Euphrates valley and it is highly probable that later it was introduced from Palestine into Egypt. Among Latin writers PLINY and COLUMELLA mention sesamum and even give some information regarding its culture. Its introduction into the other countries where it is found to-day is of later date. In China it has been known only during the Christian era. The Portuguese have carried it to Brazil.

There are two theories concerning the origin of sesamum. That of EBERHARDT puts its origin in India and the provinces with temperate climates to the north of the Himalaya and Karakorum mountains from where it spread in 3 directions, namely :—

(1) to Southern India and Ceylon, and from there was carried by the Chams, a Buddhist sect, to Java and Borneo and the southern part of Indochina;

(2) to the west into Iran, Persia, Mesopotamia and finally into Asia Minor and Egypt;

(3) to the east into China and Japan.

The other theory, that of ASCHERSON and HAMMERSTEIN, supposes an African origin. It is based on the fact that of the 12 known species of the genus *Sesamum* 10 occur in the wild state in Africa. Widespread distribution would thus have occurred in prehistoric times.

The old theory of DE CANDOLLE may also be mentioned, according to which the plant originated in the Sunda Islands; but there is little probability in this hypothesis.

The names given to the plant in different countries may perhaps throw some light on the history of its migrations. The ancient Sanskrit name was 'tila', which is the name still used by the Brahmins. In the Indo-Malay archipelago there occur a number of names which may be divided into two groups as follows :—

(1) the Malay term 'lenga' with many variations such as 'lengong' (Atjet),

'longa' (Nias), 'linga' (Bima), 'lena' (Ceram). According to EBERHARDT these are transformations of the Sanskrit root 'til'; this would also apply to the Siamese name 'na', which occurs also among the courtesans of Tonkin;

(2) The Javanese name 'widjien'.

The name used in India is 'gingil' or 'gingelly', a word from which are probably derived the Arab word 'giulgiulan', the Italian words 'giuggiolena' (Tuscany), 'giurgiulena', 'guggiulena' and 'giurgiolenena' (Calabria and Sicily) and the Portuguese names 'gengelim' and 'gergelim' used in Brazil. The Japanese name is 'koba', the Chinese, 'moa' or 'chima'; the word 'me' which is met with in Tonkin, over the Chinese frontier, throughout Annam and in the whole delta of Cochinchina is nothing but a local corruption of the Chinese 'ma'. All the other names encountered are slight variations of the word *sesamum*.

**ENVIRONMENTAL CONDITIONS.** — *Sesamum* is grown throughout the tropical and subtropical zones. Cultivation is still possible in Greece, southern Italy and in the southern States of the United States of America.

A few hot summer months suffice for the development of the plant, which, according to the temperature, gives a crop  $3\frac{1}{2}$  to  $4\frac{1}{2}$  months after sowing. It will not stand low temperatures. A mean annual temperature of  $20^{\circ}\text{C}$  is necessary. The total requirement during 120 days is  $2700^{\circ}\text{C}$ . In Italy *sesamum* takes  $3\frac{1}{2}$  months to complete its growth cycle. In Central Italy it requires even 4 to  $4\frac{1}{2}$  months. It grows well in regions where maize ripens between September 10 and 15. DEL NERO cites an 18th century writer, BOLOGNINI, according to whom *sesamum* plants of the height of a man were to be seen at Bologna in 1760.

Rain immediately after sowing is liable to be harmful but the plants require a considerable amount of moisture during the early stages of growth. If the ground is too dry irrigation is recommended. During the flowering and ripening periods no moisture is required.

Wind is not well withstood, and for this reason the crop is never a success in the south of France.

It has been recognised for a long time that *sesamum* prefers sandy soils which are porous and rich in lime. By pot experiments in India RAM KASHI and MADHAVA ROW have shown that the observations of growers are correct. Two varieties, one early and one late maturing, were grown in soils of differing composition. The series of experiments included (1) a clay soil from a rice field — (2)  $\frac{3}{4}$  of the same soil mixed with  $\frac{1}{4}$  of sand — (3)  $\frac{1}{2}$  of clay,  $\frac{1}{2}$  of sand — (4)  $\frac{1}{4}$  of clay,  $\frac{3}{4}$  of sand. The results showed in a striking manner the preference of the plant for sand. Figures and photographs are given showing that the plants of the 4th series reached the maximum height and formed the greatest number of lateral branches and capsules; the root development also was greatly superior to that of the plants grown in more or less clayey soils.

**CULTURE.** — *Sesamum* is grown either in rotation with other annual crops such as rice, wheat or cotton, or as a secondary crop associated with rice and maize, as in dry fields in Java and Sumatra; with cotton, maize and vines in the island of Cyprus. In Brazil *sesamum* is sometimes grown in coffee and maté plantations.

**Sowing.** — The seedbed must be well prepared by ploughing followed by harrowing. VON SPRECHER recommends the use of chemical fertilisers where manure is not available. The seed is sometimes scattered broadcast; it is better however to sow in rows 2 to  $2\frac{1}{2}$  feet apart. In Java the seed is mixed with ash to prevent their sticking together and also as a protection against insects. A sufficient quantity

of seed must be used ; if the seedlings come up too thickly they can be thinned when they are a few inches in height. The seed being very light, 6 to 10 kg per hectare are sufficient.

*Cultivation.* — The seeds germinate after 10 days. The seedlings are very delicate and cannot stand heavy rain. A first hoeing is combined with thinning out. Later the plant prevents by its own rapid development the competition of weeds.

*Diseases and pests.* — Very few pests are known. VON SPRECHER mentions *Epilachna chrysomelina* F. which in Africa injures the leaves, flowers and capsules ; the caterpillars of *Acherontia lachesis* F. and *A. styx* Westw., which has been found on the leaves in eastern Asia ; and *Aphis gossypii* Glov. which may migrate from cotton to sesamum. DE TYSSONSK mentions the ' walang sangit ' (*Leptocoriza acuta* Thunb.), a bug which is associated with a disease known as ' omo doean boendel ', which damaged 50 % of the plantations of the Residences of Rembang and Blora in 1928, but is not known elsewhere.

*HARVEST.* — As ripening is prolonged over a considerable period the harvest presents certain difficulties. The best method would be to gather the capsules in succession as they ripen, but this would entail too much labour. Other systems therefore are used : either the plants are pulled up when the majority of the capsules are ripe or the whole field is reaped. EBERHARDT describes the method used in Indochina as follows :— " The plants are, according to the locality, either reaped level with the ground or simply pulled up, but always some time before the fruits are ripe ; the plants are made into bundles and carried indoors. There they are left in small heaps, with care to prevent their receiving too much sunshine. They are often covered over with matting. A kind of fermentation sets in which makes the leaves turn yellow and fall, and finally only the stems are left bearing the capsules. They are then removed on the matting and exposed to sunshine, sometimes with bamboo laths under the matting. The sun speedily bursts the capsules and frees the seeds of most of the fruits. A certain number however sometimes do not open with the same facility ; these are then made to dehisce by the natives who beat the capsules with a small wooden mallet or in other regions pass wooden rollers over the matting. By these means no capsule is allowed to escape dehiscing. Women and children then separate the seeds from the debris ".

*Yield per hectare.* — It must be realised that the published figures can be only approximate. Sesamum being usually a secondary crop it would give a false idea of the yield per hectare to give simply the relationship of production to area. The following figures must therefore be accepted with reserve. VON SPRECHER mentions yields varying between 750 and 2500 kg. DE TYSSONSK gives 300-350 kg. for Java. DEL NERO speaks of 1000-1800 kg. and cites BOCHICCHIO who gives 1500-2000 kg. for Sicily. In China 300-500 kg. are estimated. The average yields in India are undoubtedly lower. It is highly probable that by scientific selection and by seeking types adapted to local conditions the yields could be improved.

*OIL EXTRACTION.* — The sesamum seed exported to Europe and America is pressed in large oil mills by hydraulic machinery. The various stages in the process are as follows :—

- (1) Cleaning of the seed.
  - (2) Crushing the seed between rollers.
  - (3) First pressing, for 1-1 ½ hours.
- This produces 22-32 % of a fine clear table oil.
- (4) Milling the cake with 4-5 % of water, then a second pressing for 1 hour.

This gives 6-12 % of darker coloured oil which is marketed as table oil of less fine quality.

(5) Repetition of the preceding operation followed by heating to 50°C. Then a third pressing, giving 8-10 % of a dark oil which is used in the soap industry.

The oil cake from the third pressing still contains 8-10 % of oil which may be extracted with carbon disulphide. The oil is very dark coloured and is used in soap making. The cake cannot be used as a stock feed but only as manure.

The methods of extraction used in the producing countries are primitive for the most part. The mills used in India are described by EBERHARDT and by VON SPRECHER with good illustrations. In Indochina and in Java the natives use presses or mortars. It is obvious that with such primitive methods complete extraction cannot be obtained; 22 % only of the oil contained in the seed is extracted. The oil is moreover darkened by the colouring matter of the seed-coat. Two methods of preventing this coloration are in use. In Indochina the seed is boiled before pressing to extract the colouring matter. In Syria the seed coat is removed by the following process:—

- (1) Steeping the seed in water for 24 hours.
- (2) Beating the softened seed with wooden slats to separate the seed coats.
- (3) Treating the mass with salt water, when the seed coats rise to the surface and can be removed.
- (4) Washing the kernels to remove the salt.
- (5) Drying the kernels in an oven.
- (6) Grinding the lightly roasted kernels in a mill till a solid purée is obtained.
- (7) Pressing by treading.

By these means 45 % of the oil is extracted.

USES AND COMPOSITION OF SESAMUM PRODUCTS. (1) *Seed*. — In the producing countries the seed is used for food. It is sprinkled over bread as a flavouring. In India it is added to rice and millet. In Africa the pounded seed is used as seasoning for vegetables. In Egypt and Asia Minor a soup is made from sesamum seed. In Palestine sesamum meal is used with lemon peel and honey to prepare 'chalbe', a Lenten dish.

The seed is also used medicinally by the natives in the Dutch East Indies.

The chemical composition of the seed is very variable. The average is:— water 5 % — protein 20 % — fat 35-57 % — non nitrogenous extractives 14-22 % — ash 4-8 %.

The oil is the part which concerns us most. The maximum oil content is 57 %. With modern presses 50 % can be extracted. No other oleaginous plant can compete with sesamum in this regard. There are however great variations; certain varieties contain only 35 % of fat. An analysis carried out by BOORSMA in Java in 1904 showed very low percentages, only 39.41 %, while VAN ROSSEM in analysing decorticated seed in 1927 found 50.8 % for a variety with a thin seed coat and 56.3 % for a variety with a thick seed coat.

(2) *Oil*. — Sesamum oil, called also til or gingelly oil, is used as an edible oil in the producing countries and in Europe. It is used also to adulterate olive oil, but such blends can be easily detected owing to the characteristic reactions of sesamum oil. In Germany the addition of 10 % of sesamum oil to margarine is prescribed by law because in this way margarine can always be recognised as such.

Indians and negroes have from remote times used the oil for anointing their bodies and hair. The fact that sesamum oil has no flavour of its own facilitates the addition of perfumes. One pound of the flowers whose perfume is desired is

added to 3 litres of oil and the whole exposed to the sun for 40 days in a closed bottle.

In the European perfumery industry jasmine and citrus flower perfumes are extracted with sesamum oil; 1 kg. of flowers is added to 6 litres of oil and left for 40 hours. The combined cultivation of citrus orchards and sesamum is thus commendable.

The inferior quality oil is used in soap manufacture and for cooking. As it does not become rancid it can be used as a lubricant. As an illuminating oil it gives an excellent even, vivid light, but burns rapidly.

In India and China it has a number of medicinal uses. It is used for dressing wounds, for intestinal disorders and for the preparation of a number of medicaments.

The freshly obtained oil has always a somewhat strong odour, but this disappears with time. According to EBERHARDT the oil has the following physical and chemical properties:—

Specific gravity at 15°C = 0.923; that of oil extracted by heat = 0.924; that of sesamum oil from the Levant = 0.9265.

“According to LEONE and LONGI the refractive index is 1.4902 at 10° and 1.4854 at 23°. The specific gravity of the fatty acids = 0.9085-0.9095. The fatty acids solidify at 32-34° and, according to BENEDIKT, melt at 26°. Saponification of 100 gm. of fatty acid requires 19.93 gm. of caustic potash. Solidification of the fatty acids takes place at about 22°, their saturation point is about 17.7°C. Solubility in absolute alcohol = 41 %. Dextrorotatory.

“Sesamum oil is made up of glycerides of the following fatty acids: solid (12-20 %), palmitic and stearic acids; liquid (88-80 %) oleic and linoleic acids.

“In addition to the principal constituents the presence of a small quantity (less than 1 %) of non-saponifiable fats has been determined, amongst which are *phytosterine*, an alcohol specific to sesamum oil, and *sesamine*, a body with undetermined function, also specific to sesamum oil.

“At 4°C sesamum oil appears still perfectly liquid; it solidifies only at — 5°C, into a yellowish white translucent mass resembling the consistency of palm oil, to which it is very similar; it is however free from any granular deposit.

“Heated to 100° sesamum oil begins to boil noticeably. At 150° it begins to change colour and becomes steadily paler until at 215° it gives off a white vapour. As it cools it regains its natural colour. From 300° the oil becomes gradually darker until it is a deep brown. When cooled it shows, like glycerine, if viewed in oblique light a very distinct green translucence (FRITSCH).

“Sesamum oil agitated with ether gives a white emulsion. After a short time the two liquids separate but the oil is found to be almost entirely bleached.”

The great facility with which sesamum oil gives intense colour reactions may be used as a rapid method of verifying its purity and of detecting traces of this oil in blends. The various processes of BALDOIN, CAMOIN, BELLIER, CAILLETET, SOLTEN, BEERENS and TOCHER are described in the works of EBERHARDT and VON SPRECHER.

(3) *Oilcake*. — The cake is made into flat squares weighing about 6 kg. Analysis shows it to have the following mean composition, though liable to variation according to its place of origin:— water 11 % — fat 12.8 % — protein 37.2 % — carbohydrates 20.5 % — cellulose 7.5 % — ash 10.9 %.

Sesamum cake is readily recognised under the microscope owing to the almost constant presence in most of the cells of the outer integument of a large crystal of calcium oxalate in rosette form.

(4) *Leaves*. — In tropical Africa the leaves of various species (*S. angustifolium*,



*S. radiatum*, etc.) are steeped in water and then pressed; the juice thus obtained is gelatinous and serves as an adhesive substance. It is also used against the biting of the tsetse fly.

In the United States the leaves are also thought to possess medicinal properties. The mucilage obtained from leaves steeped in water is used in the Southern States as a beverage in cases of affections requiring an emollient.

In Java also the natives know the medicinal properties of sesamum leaves.

PRODUCTION IN THE VARIOUS COUNTRIES. TRADE. — The available data are very incomplete, partly because in many countries sesamum is grown as a secondary crop, and partly because the figures for the most important producing country, China, are incomplete. This should be borne in mind in consulting the following statistics:—

For the area under sesamum a single example is given, which suffices to show the low value of the figures. The example reproduced in Table I is taken from DE TYSSONSK.

TABLE I. — *Acreage under sesamum in Java and Madura, in hectares.*

	1921	1922	1923	1924	1925	1926	1927	1928	1929
Acreage in hectares . . . . .	1 410	5 174	1 500	7 511	9 425	14 040	13 911	15 581	16 044

The area cultivated in 1929 would thus be more than 10 times greater than that in 1921. The writer himself criticises the figures which must result from incomplete data.

Table II, which is taken from the *International Yearbook of Agricultural Statistics*, gives an idea of the world production of sesamum.

TABLE II. — *World production of sesamum in 1930.*

<i>Europe;</i>		<i>Africa;</i>	
Bulgaria . . . . .	29 640	French West Africa (5) . . . . .	—
Greece . . . . .	74 437	French Equatorial Africa (6) . . . . .	—
U. S. S. R. (1) . . . . .	—	Angola (7) . . . . .	—
<i>America;</i>		Belgian Congo (8) . . . . .	—
Mexico . . . . .	66 247	Egypt . . . . .	48 414
<i>Asia;</i>		Eritrea . . . . .	250
China (2) . . . . .	1 162 667	Kenya . . . . .	11 491
Cyprus . . . . .	4 942	Mozambique (9) . . . . .	—
Korea . . . . .	41 051	Nigeria . . . . .	97 012
Formosa . . . . .	10 845	Sierra Leone (10) . . . . .	—
British India . . . . .	5 314 000	Italian Somaliland . . . . .	16 800
Dutch East Indies . . . . .	50 249	Anglo-Egyptian Sudan . . . . .	456 976
Indochina . . . . .	16 618	Tanganyika . . . . .	31 650
Japan (3) . . . . .	—		
Kouan Toung . . . . .	313		
Palestine . . . . .	223 650		
Siam (4) . . . . .	—		
Syria and Lebanon . . . . .	17 870		
Turkey (in Europe and Asia) . . . . .	287 678		
		Total . . . . .	7 962 791

(1) In 1928: 115,000 qx. — (2) Export figures. — (3) In 1929: 31,241 qx. — (4) In 1929: 11,500 qx. — (5) In 1927: 9,700 qx. — (6) In 1928: 45,000 qx. — (7) In 1929: 4,947 qx. — (8) In 1929: 112,625 qx. — (9) In 1928: 2,571 qx. — (10) Exports in 1929: 1,819 qx.

The approximate estimate of the world production at 8 million quintals is somewhat low. The most important producing countries are British India, China and the Anglo-Egyptian Sudan.

*British India.* — Area cultivated :— 2,089,000 hectares. Production : 4,746,000 quintals (average from 1920-21 to 1928-29). A yield of 2.27 qx per ha may thus be calculated. The acreage of secondary sesamum crops is relatively low : 324,000 hectares. The area has not increased greatly of recent years. Exportation, which before the war reached about 25 % of the total production, has considerably diminished ; in 1925 it represented no more than 5 % of the production.

*China.* — The cultivation of sesamum is widespread. The main centre is the valley of the Yang-Tse-Kiang. The seed is used to some extent for consumption but by far the greater part is used for oil extraction. Three sorts of seed may be distinguished, white, yellow and black. The chief markets are Hankeou and Shanghai. The best product comes from the province of Kiang Si ; that from Tse Chouan is of inferior quality.

DE TYSSONSK, who had at his disposal recent figures, estimates the acreage under sesamum at 730,000 ha. and the total production at 2 million quintals. These figures are not complete as they do not include the large output of the province of Shansi. Annual exports vary between 300,000 and 600,000 quintals. The greatest purchaser is Japan.

The steady increase in sesamum cultivation and trade dates only from the beginning of this century. The increased acreage under sesamum in partly due to the diminution in the growing of the poppy. The favourable prices of the years previous to 1929 encouraged Chinese peasants to take up sesamum growing.

*Anglo Egyptian Sudan.* — The cultivation of sesamum and its yields have increased considerably of recent years, as is shown in Table III.

TABLE III. — *Cultivation and production of sesamum in the Anglo-Egyptian Sudan.*

	1927	1928	1929	1930
Acreage in hectares . . . . .	37 549	39 510	81 547	84 643
Production in quintals . . . . .	202 723	213 308	440 261	456 976

The centres of production are in the provinces of the Nuba Mountains, Fung, Cordofan, Kasala and the White Nile. A great part of the crop is exported, mainly to Egypt.

*Trade.* — Tables IV and V show the surplus exports and imports of sesamum seed.

TABLE IV. — *Surplus quantity of imports and exports of sesamum seed from the different continents, in quintals.*

	Exporting Continents		Importing Continent
	Asia	Africa	Europe, including U. S. S. R.
Average 1909-1913 . . . . .	2 603 000	32 000	2 496 000
» 1927 . . . . .	301 000	123 000	329 000
» 1928 . . . . .	610 000	130 000	583 000
» 1929 . . . . .	866 000	187 000	912 000
» 1930 . . . . .	960 000	171 000	986 000

The countries mentioned in Table V are the most important importers of sesamum seed.

TABLE V. — *Surplus quantity of imports of sesamum seed in various countries, in quintals.*

	Average 1909-1913	1927	1928	1929	1930
Germany . . . . .	1 072 658	48 131	87 184	137 934	358 227
Denmark . . . . .	47 195	60 288	97 443	106 423	66 223
France . . . . .	571 509	44 586	66 119	37 592	28 763
Great Britain and Northern Ireland . . . . .	—	2 001	5 467	94 628	74 690
Italy . . . . .	320 788	31 121	122 690	158 125	257 571
The Netherlands . . . . .	—	81 670	135 150	169 820	97 080
Rumania . . . . .	13 201	18 346	—	20 177	21 702
Jugoslavia . . . . .	243	18 024	17 841	57 820	67 141
Japan . . . . .	52 396	174 845	209 923	199 406	235 373
Malaya . . . . .	5 522	25 005	31 223	32 666	32 484
Korea . . . . .	2 710	24 958	39 529	38 747	41 467
Egypt . . . . .	38 277	103 270	83 726	123 129	126 481
Italian Somaliland . . . . .	—	9 204	18 207	13 753	18 586

It is apparent that the greatest pre-war importers, Germany, France, and Italy, are no longer reaching the figures of the 1909-1913 period. Importation into Germany and Italy has increased since 1928, while into France it has steadily decreased. As countries newly acquiring prominence as importers of sesamum may be mentioned Egypt and Japan.

Tables VI and VII show the principal countries exporting and importing sesamum oil.

TABLE VI. — *Surplus quantity of exports of sesamum oil, in quintals.*

	Average 1909-1913	1927	1928	1929	1930
Germany . . . . .	*	1 077	6 085	15 489	33 862
France . . . . .	119 404	23 414	24 044	23 286	1 330
Great Britain and Northern Ireland . . . . .	—	10	640	42 023	13 218
The Netherlands . . . . .	- 5 894	30 150	54 750	82 930	34 680
China . . . . .	8 087	1 534	1 629	1 606	1 500
British India . . . . .	7 853	3 338	6 304	7 401	6 311
Kenya . . . . .	152	536	896	1 459	1 339

\* The figures previous to 1926 are not comparable as they include groundnut oil. The minus sign indicates surplus imports.

TABLE VII. — *Surplus quantity of imports of sesamum oil, in quintals.*

	Average 1909-1913	1927	1928	1929	1930
Denmark . . . . .	12 132	344	- 6 772	- 12 834	1 396
Poland . . . . .	—	112 732	122 832	189 871	135 842
Sweden . . . . .	17 120	231	225	276	4 021
United States . . . . .	—	7 730	28 299	97 919	49 335
Turkey . . . . .	7 604	20 120	26 930	25 056	133

The minus sign indicates surplus exports.

The prices have become lower since 1927. DE TYSSONSK quotes the following mean prices for Java from figures given in the *Handels Vereeniging* of Soerabaja.

TABLE VIII. — *Average trade prices in florins per quintal at Soerabaja.*

	Seed	
	White	Black
1925 . . . . .	23.7	23.7
1926 . . . . .	24.1	20.8
1927 . . . . .	24.4	19.9
1928 . . . . .	22.2	19.0
1929 . . . . .	18.4	16.9
1930 (January-October) . . . . .	12.9	12.1

Since this time the prices have become steadily lower. The figures given in Table IX are taken from the German periodical *Der Tropenpflanzer*.

TABLE IX. — *Prices for sesamum seed in pounds sterling per ton c. i. f. (Hamburg/Holland).*

	Seed	
	White	Varying colours
	£ s	£ s
17 January 1930 . . . . .	16 10	15 15
17 December 1930 . . . . .	11 15	10 15
17 March 1931 . . . . .	13 10	12 10
17 July 1931 . . . . .	13	12
17 October 1931 . . . . .	14	12 5
14 January 1932 . . . . .	15	13 15

M. BOUCHET, French Commercial Attaché in Belgium, wrote in July 1931 as follows :—

“ Sesamum seed oils, which were formerly much used, are finding their markets disappearing one after the other. They are scarcely or not at all used any longer in the margarine industry. The Near East alone continues buying in small quantities.

“ It is generally expected that extraction of sesamum seed will be partially abandoned in the near future for lack of demand for the oils ”.

GENERAL CONCLUSIONS. — Although the present situation in the sesamum industry is not favourable it would appear that there is still a future for the crop in tropical and subtropical countries. The French and Italian writers cited desire to see an extension of sesamum cultivation, the former in Indochina to supply France, and the latter in Southern Italy. VON SPRECHER considers that there may be prospects for sesamum in Brazil and Northern Argentina, particularly if grown in association with citrus orchards for the preparation of fine perfumes.

It will be necessary to keep two purposes in view, namely, to promote the use of sesamum oil, which in view of its excellent qualities could certainly find a number of additional uses, and to improve crops by the choice of soils which in physical and chemical composition are favourable for sesamum growing and by varietal selection.

W. BALLY.

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## AGRICULTURAL ENGINEERING

### Motor Mowers and their Use: Results of an International Enquiry.

The Agricultural Engineering Council of the German Government (R. K. T. L.) publishes in its 32nd brochure a series of studies on the subject of engine-fitted mowing machines supplied by 10 collaborators in 7 countries who describe the technical and economic importance of these small machines on the farm.

From a technical standpoint the different types of construction may be classified as follows (Reporter, M. LERCHENMÜLLER, Stuttgart) :—

(1) Simple animal-drawn mowers in which the cutter bar is worked by the engine, so that one animal suffices for traction.

(2) Two-wheeled mowers steered by handles, the engine driving the running wheels as well as the cutter bar.

(3) Four-wheeled mowers with driver's seat. These mowers may be used also as small tractors for hauling other machines or vehicles.

(4) Automobile mowers, composed of automobile parts and in general built from a motor vehicle intended for carrying passengers. The engine works the cutter bar directly by means of a power take-off. Vehicles of this type are used primarily as mowers but also for transport.

Economic considerations (Reporter M. GALLWITZ, Karlsruhe) show, on the basis of an enquiry sent to 215 owners of motor mowers, that 44 % of the machines studied were used on farms of upwards of 10 ha, 32 % on farms of between 5 and 10 ha, and 24 % on farms of less than 5 ha. The farms of over 10 ha are principally stock farms which utilise motor mowers to relieve the work of men and beasts at the hay harvest. For this reason the 2-wheeled completely engine-driven machines are preferred.

On the medium-sized farms on the other hand, more of the small tractors are used, for in this case the machine entirely replaces draught animals, the use of which would be uneconomic. In particular dairy cows, which on farms of this size are used for traction, are freed from such work as a result of the machine.

On small farms the machines are still not such used on account of their cost. They may serve on such farms as much to replace labourers as to relieve dairy cows from traction.

The purchase of a motor mower is justified by the fact that in small farms 85 % of the time when the machine is in use is devoted to mowing. Of the small farms 65 % have hired out the mower, so that it is not only a substitute for the scythe but a source of additional revenue.

In the medium-sized farms only 47 % of the use of the machine is for mowing, and 35 % of the farms let it out on hire. The machine is thus used to replace animal traction and for all other possible kinds of work.

In the farms of over 10 ha the machine is used for mowing during 91 % of its annual hours of use and only 14 % of the machines are hired out. The machine is in these cases therefore primarily a mower.

The calculation of mowing costs is not simple. When the usual method of depreciation and interest is used the machine appears uneconomical in comparison with animal traction. Motor mowers are used on farms of over 10 ha for, on an average, 130 hours per annum. Thus to attain the 6000 hours of use of a large tractor these small machines must reach an age of 46 years. In small farms they must even last for 100 years. When the machine is worn out after 1000 hours of work and interest on the capital is 5 % the cost is calculated at 1.5 marks per hour; to this must be added the running expenses (fuel, oil, repairs, not including the driver's wages) which brings the cost of each hectare mown to 8.80 marks.

Motor mowers thus cannot work more cheaply than the scythe or the animal drawn mower, but they offer improved conditions of work, which are procured at the cost of restrictions in other directions.

During the hay harvest mowing represents about 5 % of the total hours of labour and 25 % of the working hours of horses (Reporter M. von OW, Weißenstaphan). Measured by a technical method mowing requires 8 h. p. per ha. per hour, which represents 45 % of the mechanical work of the hay harvest (Reporter, M. FISCHER, Hohenheim).

A still better utilisation of the power of a motor mower is obtained by attaching a tedder to the machine; a further 18 % approximately of human labour thus passes to the account of the mower. These two methods of calculation show that if part of the hay harvest is to be mechanised the motor mower is the first machine to introduce.

In Switzerland (Reporter, M. HAUSER, Brougg) a number of experiments have been carried out with motor mowers. The number of these machines in Switzerland is estimated at over 2,500; about 95 % of them are small mowers steered like a hand-cart. One type has the cutter bar in front, another behind the right-hand running wheel and a third type, which is less common, has the front and hind wheels on the left side worked by the engine while on the right there is a single wheel running free; this arrangement makes the machine very easily steered. Enquiries among 130 owners showed that 41 cultivate an acreage of 2 to 5 ha, 66 of 5 to 10 ha. and 23 over 10 ha. About  $\frac{1}{3}$  of the machines are hired out and so repay part of the cost of mowing the owner's own meadows. Half of the machines included in the enquiry were used for mowing while the other half was used to work station-

ary machinery and for traction. Running costs were on an average 1.35 R. M. and repair costs about 0.38 R. M.

In France (Reporter, M. TRIPOTIN, Malroy) a certain number of German and Swiss motor mowers are in use. A series of machines is also manufactured; two firms equip an ordinary mowing machine with an engine, a drivers' seat, front wheels and a fly wheel, so that it can be self-propelled. A certain number of small workshops fit simple mowers with an engine working only the cutter bar, the machine still requiring animal traction. Certain self-propelled mowers are built by small artisan workshops, but are not yet of any importance. French farmers with a large acreage of grassland utilise motor mowers almost exclusively for mowing; they can always find on the market machines adapted to their requirements. Small farmers however who require to use the mower also for hauling other machines including a small plough, require a number of modifications and improvements made in the existing machines.

In Belgium (Reporter, M. BOUCKAERT, Gembloux) few motor mowers are used. Two German machines are in use in the hilly region of Verviers. One of these machines is on a grass land farm of 19 ha. divided into 8 fields. The other is on a similar farm of 18 ha in 6 fields. Both machines are also used to haul tedders, rakes and hay carts, so that each machine allows of an economy of two horses. One machine has done a considerable amount of work on hire at 33 R. M. per hectare.

In Northern Italy (Reporter M. ALPE, Milan) there are about 68 motor mowers of Swiss type in use and 10 Italian machines.

The Italian machine is an ordinary mower made self-propelling by the addition of an engine and a front wheel. Certain machines of a new type are still awaiting trial. In the grassland farms of Northern Italy motor mowers have been introduced because the hot weather during the hay harvest is found to fatigue horses very rapidly.

In Czechoslovakia (Reporter, M. WIRTH, Tetschen-Liebwerd), only a few motor mowers of Swiss origin are used. They have been introduced in the undulating country of Bohemia. Enquiries made among a number of owners showed that the annual hay crop varies between 8 and 20 ha. and that the total hours of use of the mowers, including other work, varies between 76 and 140 hours.

In the United States (Reporter, M. SCHNELLBACH, Berlin) there are a great number of small horticultural tractors, certain of which are fitted with a cutter bar and can be used as mowers. A motor scythe should be mentioned as an original invention composed of a steel wheel propelled from behind by handles, while the small engine works only the cutter bar. This machine costs little more than an ordinary mower but is not strong enough for heavy work in thick growth. The other machines are primarily intended for garden ploughing and harrowing and are only occasionally utilised for mowing.

This short survey cannot be better concluded than with the final passage of the R. K. T. L. brochure:

"In this collection of reports on motor mowers one of the fundamental problems of European peasant farming is studied for the first time in common by a number of countries. It is the first time that one of the urgent problems concerning the European peasant, who is in danger of being swallowed up in the economic deluge and whose miserable conditions differ from country to country in intensity but not in character, has been treated in this way".

Dr. OTTO SCHNELLBACH,

*Engineer, Reichskuratorium für Technik in der Landwirtschaft, Berlin.*

## LIVESTOCK

## Miscellanea.

## General Questions.

PRESENT POSITION OF STOCK BREEDING IN GERMANY. — Prof. GÄRTNER of Jena communicates interesting facts concerning stock breeding in Germany based on the last census returns (December 1931).

The stock of *horses* was at the end of 1931 2 % below that of the preceding year; the fall is about 10 % in relation to the 1926 and 1913 figures. This fall is not due to mechanisation but rather to the fact that the horses used for purposes other than agriculture (industry, luxury horses) have been suppressed. As a result of the crisis on small farms and peasant holdings horses are being replaced by oxen and cows. On the other hand worn out engines are no longer being replaced by other machines but by horses. The demand for draught horses seems to be reaching an equilibrium; the German horse breeding industry is taking this into account as is shown by the small increase in the number of foals of under one year.

The number of *donkeys* and *mules* is continually decreasing in Germany.

The stock of *cattle* has increased; not only in relation to that of the previous year but also to that of the pre-war period. The increment is greatest in the young stock, in the categories of dairy cows and cows used for milk production and work.

The present stock of *swine* gives the impression that the overproduction is nearly at an end; breeders are obliged by reducing the number of breeding sows to make pig raising more productive.

It is an interesting fact that in spite of the crisis *sheep* breeding has not lost ground. There is thought to be even a slight increase in peasant sheep raising. The stock of *goats* is on the other hand still decreasing; since 1926 there has been a reduction of 1 million head, i. e., of 30 %. The number of kids has risen however in 1931, which would seem to indicate that the reduction in the stock of goats is coming to an end.

There has been a considerable fall in the numbers of *poultry*: fowls reduced by 4 to 6 %, geese by 9.1 %, ducks by 8.6 %. The reduction in young stock is surprising. This fact shows the unsatisfactory state of the industry and the failure of a number of poultry farms.

The comparison of these data with the statistics of foreign trade throws an interesting light on the stock farming situation in Germany of recent years. The value of the *horses* imported in 1930 was 7.42 million marks, while in 1929 it reached 11.46 million. The greater part of these horses came from Belgium, Luxemburg, the Netherlands and Denmark. The value of the imported horses nearly reached that of the exports and increased in the same time from 6.46 to 6.89 million marks. The principal purchasers were France and the Netherlands.

The value of the *cattle* imports fell from 88.38 million marks in 1929 to 63.41 million in 1930. The greater part of the imports came from Denmark. While in 1929 the value of the cattle exported exceeded the imports by only 1.06 million marks, in 1930 it exceeded them by 17.99 million marks. A large part of the exportation was to the Saar and France.

The *pig* imports reached 18.33 million marks in 1930, while in 1929 they were only 15.62 million. The large part taken by Lithuania (12.23 million marks) in this importation was remarkable, while Denmark exported only 5.42 million marks' worth of pigs into Germany.

German exports underwent a large increase: from 2.51 million marks in 1929 to 34.87 million in 1930. A great part of the pig exports were directed to the Saar and France.

In 1930 most of the imports of *meat, bacon* and *products of the curing industry* came from Argentina, the Netherlands, Denmark and the U. S. S. R.; most of the exports went to France and the Belgo-Luxemburg Customs Union.

In 1930 50 % of the imported *milk*, which represented only half the imports of 1929, came from the Netherlands. Of the exports, which were less important elsewhere, 2/3 went to England.

*Butter* was imported to the value of 376.95 million marks, of which 129.41 million came from Denmark, 83.66 million from the Netherlands, 14.94 million from Lithuania and 14.39 from Finland.

In 1930 the value of imported soft and hard *cheese* was 88.37 million marks, of which 53.75 million came from the Netherlands, 12.9 million from Switzerland and 5.85 from Denmark.



Germany paid 227.98 million marks for imported eggs in 1930, of which 69.09 million went to the Netherlands, 25.34 million to Bulgaria, 22.83 to Rumania, and the rest to Belgium, Poland and Yugoslavia. Imports of Russian eggs fell from 40.70 million marks in 1929 to 12.78 million in 1930.

In 1930 the imports of wool fell by about 300 million marks, which indicates the precarious situation of the German textile industries.

GENERAL ASSEMBLY OF THE GERMAN STOCKBREEDERS' SOCIETY. — At this Assembly which was held on 3 February 1932, Prof. SPÖTTEL (Halle) delivered a lecture on the influence of feeding on the external characteristics, yield and organs of sheep. According to the lecturer the appearance and yield depend on heredity, environment (feeding, climate), etc. The environment makes apparent non-hereditary qualities. A protein-rich ration increases girth, while inadequate feeding gives increased height. The effects of feeding on wool production is clearly apparent with protein-rich feeds: the weight of the fleece increases and the ratio of washed to crude wool is reduced.

In a lecture on the inheritance of shape and of the skeleton in cattle M. KÖPPE (Directeur d'Élevage) discussed the hereditary influence of the bulls renowned for creating the chief herds in Germany.

RELATIONSHIP BETWEEN THE PRICES OF GEESSE AND PIGS. — This relationship is studied by M. P. GROSS (*Blätter für landw. Marktforschung*, Berlin 1931, fasc. 11) for October, November and December, during which months the high spring and summer prices fall so low that goose becomes accessible even to the poorer classes of buyers. Goose meat then comes into competition with pork, which it resembles in its fat content and mode of utilisation.

As regards the fixing of the prices it may be stated that the prices of these two meats follow a parallel course which is not fortuitous. The price of goose does not depend exclusively on the supply, but also on the price of pork. It should however be added that in general the prices of goose meat oscillate less violently than those of pork.

### Feeding and Foodstuffs.

FOOD VALUE OF SPROUTED OATS. — Messrs. A. URBAIN and G. GUILLLOT, of the Military Laboratory for Veterinary Research, show as a result of research described in the December (1931) number of the *Revue de Zootechnie*, that dry oats may be replaced in horse feed by an equal quantity of sprouted oats. In a ration of 5 kg of oats this makes it possible to economise about 2.15 kg (5 kg of sprouted oats corresponding to 2.285 kg of dry oats). It should be emphasized that sprouted oats are always readily taken by horses without any digestive trouble resulting. At first the dung is somewhat softened. The writers used in their experiments a germinating chamber with automatic sterilisation invented by M. L. RAYBAUD. The apparatus is described in detail in the article.

INFLUENCE OF THE ACIDS FROM SILAGE ON THE DIGESTION OF RUMINANTS. — In the *Zeitschrift für Züchtung*, Reihe B, Bd. XXIII, 1932, M. W. LIEBSCHER describes an experiment on the influence of lactic and butyric acids on the absorption of feeds and phosphorus metabolism. The results obtained show that these acids if they occur only in small quantities in the feeds have no ill effects on the digestion of sheep and even promote the retention of nitrogen, calcium and phosphorus.

### Horses.

INSTITUTION OF A 'YIELD BOOK' FOR LIGHT HORSES IN POMERANIA. — The Light Horse Breeders' Association ('Verband der Warmblutzüchter') of Pomerania was the first of the similar Associations in Germany to institute a 'yield book' for the light horses. Right of inscription in the book is open to all mares of 5 years or more which are entered in the Pomerania light horse studbook and have been served in the year of inscription and have successfully passed the tests of capacity for work, for heavy traction and for ploughing. These tests require the following yields:—

(1) *Test of capacity for work.* — A pair of horses drawing a load of 35 quintals, including cart and driver, must cover a distance of 3 km in 27 minutes walking and 3 km in 12 minutes trotting on a good road.

(2) *Test of capacity for heavy traction.* — With the fixed load (including cart and driver) a pair of horses must cover 30 km on a good road, of which 15 km is with the

load, walking, and 15 km without load. In the latter case trotting is optional. For the course with load the maximum speed must be 8  $\frac{1}{2}$  minutes per km and the minimum speed 9  $\frac{1}{2}$  minutes per km. For the course without load the maximum speed is fixed at 5 minutes per km and the minimum at 6 min. per km.

(3) *Test of capacity for ploughing.* — The horses, 2 or 3 to the plough, must give 8 hours of net work. The draught must be 120 kg per horse. The length of pace without load must be 90 cm. that while working must be at least 80 % of that without load. The rate of progress must be at least 70 m per minute.

In addition to these tests the constitution, general condition, paces, spirit, safety in harness and perfection of training for traction are examined.

### Cattle.

STUDY OF THE CONSTITUTION OF THE PRINCIPAL HERDS OF MOUNTAIN CATTLE IN WURTEMBERG. — From his study of this question M. P. GARSTENS has reached the conclusion that regular selection with constant observation of the aptitudes of both sexes is one of the best means of ensuring a successful herd as regards yield. In addition to direct aptitudes the indirect, hereditary aptitudes should be studied in order to be able to judge of the breeding value of the progeny. As regards constitution the best milk yielders are found to be also those with the highest constitutional qualities. In general care should be taken to avoid introducing into the herd animals coming from families in which there have been frequent occurrences of the birth of twins. In-breeding has proved an effective method of improving the herd. (*Arbeiten der deutschen Gesellschaft für Züchtungskunde*, Hannover 1931, Heft 51).

TELEMARK CATTLE. — The Telemark cattle are one of the rare primitive Norwegian breeds which has remained almost pure in spite of frequent attempts at crossing. The breed is studied exhaustively by O. BORODAJKFWYCZ (*Zeitschrift für Züchtung* Reihe B. Bd. XXIII, 1932).

Descriptions are given of the breeding area, the origin and history of the breed as well as of the characteristics of the breed. The cattle are apparently mostly of the *Bos primigenius* type, though animals occur also with the characteristics of *Bos brachyceros*. The history of the breed is interesting and it appears that the cattle particularly in the high altitudes of the country, are scarcely influenced by the invasion of Ayrshires into Norway which has absorbed the greater number of the primitive breeds of the country. The qualities of the Telemark cattle have even been strengthened by an inbreeding often carried to considerable lengths. The breed thus has well-marked characteristics and is perfectly adapted to the conditions of its breeding area. The careful selection for milk production which has been practised over a long period has produced excellent dairy cows, while the beef yield is regarded as of secondary importance, particularly as the animals are of relatively small build. They are not utilised for work. Interesting details are also given regarding the breeding methods and management of the breed. Calving takes place in autumn, for it is found that this practice is conducive to a high milk yield during the summer grazing. The wooden cowsheds often leave much to be desired.

### Sheep.

CORRELATION BETWEEN CRIMP AND DIAMETER OF WOOL. — The difference in average crimps per inch for a great number of samples is very small per unit of diameter, as is also the difference in average diameter per unit of crimp. The variations in number of crimps per unit of diameter and in average diameter per unit of crimp are, on the other hand, considerable.

It stands to reason that certain countries, for example Germany, grade their wool only according to differences in diameter, ignoring what has no practical significance though it has a real correlation. Other countries, for example South Africa, have proposed a wool standard comprising both crimps per inch and average diameter. (J. H. W. TH. REIMERS & J. C. SWART, *South African Journal of Science*, Vol. XXVIII, pp. 315-322, Johannesburg, November 1931).

RETAIL AND WHOLESALE PRICES OF MUTTON. — In the *Union Quins* of 5 February 1932 M. H. ROUV discusses the fluctuations in the wholesale and retail prices of mutton. He finds from French statistics that there is no exact correspondence between the two. A fall in retail prices does not immediately follow on a reduction on the wholesale market, but a lag occurs when it is a matter of a rise as well as of a fall. The cause of the dif-

ference between wholesale and retail prices being accentuated recently is, according to the writer, the fall in the prices of skins and suet and the recent reduction in offal. Moreover, as regards prices the leg and brisket of mutton behave as two entirely different articles.

Apart from the causes already mentioned there are other factors producing a difference between production and consumption : there is reduced consumption, disproportion between the expenses of the butcher and the amount of his sales, etc. But the writer considers that the relative dearness of retailed meat is the result of an organic defect in the distributing system. The remedy would be on the one hand a lightening of trade costs and on the other hand a progressive elimination of superfluous butchers' shops so that the remainder would have increased sales.

E. M.

## AGRICULTURAL INDUSTRIES

### **The International Wine Conference and the International Institute of Agriculture.**

At the opening session of the International Wine Conference on 7 March 1932, the Vice-President of the International Institute of Agriculture, M. LOUIS-DOP, announced that a satisfactory agreement had been reached between the International Institute of Agriculture and the 'Office International du Vin' which, while respecting the complete autonomy of the two international institutions, would make it possible in the future for close collaboration in their efforts to satisfy the wishes and requests of the wine industry in all States.

The full value of this important announcement will show in the days following the International Wine Conference in giving effect to the programme drawn up by the Conference after 5 days of strenuous but fruitful discussions.

It would be useless to reproduce yet again the recommendations of the Conference on the 11 items of the agenda, but it would seem of value to draw attention to the special points on which a constructive work may be built up based on the alliance between the I. I. A. and the O. I. V.

There is in the first place, in the direction of co-operation and credit for viticulture, the possibility offered to vine growers of making better wine and storing it with more security. There is also the suppression of non-marketed wines which weigh heavily on the market in years of bumper crops. There is again for small growers an increase in the possibilities of selling their wine and selling it at more profit. Finally, in addition to a better utilisation of the by-products, there is the development of co-operation and credit with loans at reduced rates and grants for the construction and equipment of co-operative storage, which would give economic advantages of the first order to vine growers.

The Delegates were in unanimous agreement also on the recommendations of the Conference with regard to the need for freeing the world wine market from its present congestion, as much by distillation of surplus and particularly of bad wine as by increased consumption of table grapes and their derivatives. The magnificent example of Italy in her annual 'Grape Festival' and Grape Stations, that of Spain with her 'Official Grape Chamber', of France with her Federation of Grape Stations and of Portugal with the formation of 7 Grape Stations in 1931, were all cited at the Conference and it will be for the I. I. A. to bring about the adoption of similar resolutions by all the States which are members of this mother-house of agriculture.

The Conference reached unanimous conclusions also on a certain number of technical questions. As regards hybrids it seemed necessary to recommend scientific research and experiment in all the experimental vineyards and competent

oenological institutions. At present the members of the Conference think that it is necessary to prevent the planting of new vineyards of high yield, which aggravate the present crisis by increasing the glut in production and debasing the old wine industry.

As regards adulteration and for the protection of local designations of origin, the Conference saw clearly the necessity for all vine growing States to adhere to the Madrid Conference and for an international agreement for the suppression of watering of wines and of the making of vegetable or fruit beverages sold fraudulently as wine. The Conference condemned 'dumping' in any form and showed that in commerce as in other concerns, honesty is the best policy.

The establishment of viticultural records (*casiers*) indicating the composition of the wines of the year to be published regularly by the O. I. V. is a recommendation which is also highly satisfactory and will make it possible to secure the good quality of wines on the market.

The recommendation relating to the standardisation of methods of wine analysis was approved by all Delegates, those from producing as well as those from consuming countries. It is thus highly desirable that as soon as possible it should be required that wine should be accompanied by a certificate of analysis and that this should be drawn up in accordance with an international vocabulary so that the result would be expressed in a uniform manner.

There remain the problems of general viticultural policy which were the subject of very ardent discussions and on which it was evident that unanimity is far from being realised among the States. It is noteworthy however that an agreement was reached to recommend limiting or even stopping for a certain time the planting of vineyards. Such a measure is not modern and revolutionary, for in 92 A. D. the Emperor Domitian forbade planting of new vineyards throughout the Roman Empire.

As regards prohibition the Conference took cognizance of the announcement of the Consul of Finland in Paris concerning the return of Finland to the "wet system". Valuable information was given with regard to prohibition on religious grounds and the Delegation of Algeria in particular showed that it is possible to arrange with the religious authorities to allow the Moslem peoples a moderate consumption of wine, which is an essentially healthy and tonic beverage. There is thus a new field for activity in developing the consumption of wine among the Mohammedan and Buddhist peoples who, according to the estimate of the President of the Council, M. TARDIEU, in his speech of 7 March, number over a thousand millions of abstainers ignorant of wine.

Besides religious and legal prohibition there is an indirect prohibition which is not less serious, that which results from custom duties and excessive tariffs. Without doubt the protectionist tendencies and fiscal needs of the various States allow no hope that the question will soon reach a satisfactory solution. However, on this question also the Conference showed that it is in a spirit of concord and in international interests that this difficult problem should be solved.

Such is a rapid résumé of the work accomplished by the International Wine Conference. It will be apparent to all that on each of the points concerning world viticultural policy the Conference has freely tackled all the problems before it and once the diagnosis was made has recommended either suitable remedies or at least palliatives.

For viticultural countries the vine is both a glory and a misery. But the Delegates to the International Wine Conference have shown themselves disposed to

recommend to their respective Parliaments and Governments all the measures necessary to prevent its death. The Conference has done the best it could. May the combined efforts of the International Institute of Agriculture and the 'Office International du Vin' see to it that the vast programme drawn up by the International Wine Conference is given effect and becomes the source of a new prosperity and a new life for the vine, grapes and wine.

LEON DOUARCHE,

*Director of the Office International du Vin, Paris.*

## Miscellanea.

### INDUSTRIES OF PLANT PRODUCTS.

**BANANA DISTILLATION.** — According to M. E. I. DE LA PERSONNE banana distillation is capable of yielding highly profitable returns if worked on genuinely scientific lines with perfect fermentation. The initial outlay will be quickly repaid and the industry should rise to a high degree of success. (*Les Produits Coloniaux et le Matériel Colonial*, Paris 1931, No. 81).

J. I.

**SEPARATION OF EDIBLE OILS BY REFRIGERATION.** — Messrs. MOINHO SANTISTA of São Paulo, Brazil, have recently installed refrigerating plant for producing edible oils from cotton-seed, etc. After deacidification with soda, bleaching and deodorisation of the oil by means of superheated steam at 200°, the hot oil is cooled to 60° in chambers cooled by circulating water and then passes into double-walled crystallisers. Cooling is effected as slowly as possible. First the stearine is separated by filtration under pressure then, according to the oil treated and industrial requirements, is effected the fractional separation of the different glycerides, e. g., palmitine, olein, linolein. (*Bulletin international des Renseignements frigorifiques*, Paris 1931, No. 5).

**SOLIDIFICATION OF OILS AT LOW TEMPERATURE.** — Hydrogenation of vegetable oils is usually effected at 155°-180°C., but absorption of hydrogen can be considerably increased, even at low temperatures, by means of catalysts and high pressure (140-150 atmospheres).

In the case of linseed oil, in the presence of nickel and ether the double combinations can be more readily saturated, and a fat of medium consistency very useful in the soap industry is obtained. (*Chemische Umschau*, Berlin 1931, p. 289).

**MANUFACTURE OF 'DRY ICE' IN THE U.S.S.R.** — By order of the Higher Council of Public Economy the 'Chladozentr' (Refrigeration Centre) is to set up factories at Rostov-sur-Don, Astrakhan and Moscow for starting the production of solid carbon dioxide early in 1932. (*Bulletin international de Renseignements frigorifiques*, Paris, 1931, No. 5).

**FOOD PRESERVING BY ULTRA-SHORT WAVES.** — M. Robert PAPE of Soest, Holland, finds that ultra short waves (25 cm.-1 m.) are able to check the decomposition of food materials. After about 10 days these waves form within a radius of 2 m. round the apparatus an electro-magnetic field inside which no organic matter can, according to the inventor, undergo decomposition. The extent of this electro-magnetic field is a sphere of about 30,000 cubic metres.

The preservative action of the field penetrates everywhere, through stone, iron, lead, wood, glass, etc. and makes itself felt inside and outside in any atmosphere and at any temperature. The cold storage industry should be keenly interested in this new invention for the apparatus, which occupies only a few cubic metres, will produce a food preserving zone of 30,000 cu. m., requiring no greater power than a 200 candlepower electric bulb, and will give results definitely superior to those of a modern cold store with costly machinery and a skilled staff.

Since M. PAPE's recent demonstrations the invention has attracted keen interest among scientists.

Experiments carried out by M. PAPE showed that foods placed on plates in different parts of a house and garden after several months were absolutely unaltered. Potatoes of the 1930 crop though slightly discoloured were still edible. Eggs broken on to a plate were after several months, though somewhat dried, still without trace

of decomposition, while whole eggs kept in the house since 23 May 1930 showed when broken a good yolk colour and were without odour. From reports published by A. VAN RAALTE, Chief of the Meat Inspection Service of Amsterdam, it appears that milk kept for 2 weeks in the electro-magnetic field had not increased in acidity, that pears after several months still preserved intact the qualities they possessed when introduced into the field and that from shrimps to which only 4 % of salt had been added no liberation of ammonia could be detected after 2 weeks' exposure to the waves. (*Ice and Refrigeration*, June 1931, p. 484; November 1931, p. 358 — *Bulletin international des Renseignements frigorifiques*, Paris, Nov.-Dec. 1931, No. 16454).

**DETERMINATION OF DRY MATTER IN PRESERVED TOMATORS.** — By means of a number of facts F. ARNAUDO shows that the benzol method gives constant and comparable values, thus eliminating the inevitable errors of the ordinary method of direct desiccation. The certain correctness of the results obtained makes it possible to discard products of inferior quality and avoid commercial disputes. (*Annali di Chimica applicata*, Roma 1931, No. 12).

**EXTRACTION OF VEGETABLE AMBER FROM *Cistus ladaniferus*.** — By extracting leaves and stems of this species of *Cistus* with boiling water resins are obtained which after rectification in a current of steam give an essence with a powerful odour resembling that of ambergris. The green oleoresins extracted by solvents from leaves and stems of the same plant possess particularly aromatic and valued qualities of odour. (*Chimie et Industrie*, Paris 1931, No. 6).

#### INDUSTRIES OF ANIMAL PRODUCTS.

**WATER LOSSES OF REFRIGERATED MEAT.** — Refrigerated meat undergoes histological, physical, chemical and bacterial alterations.

Experiments carried out by MM. LASSABLIÈRE and MORA to explain the water losses during refrigeration of meat intended for food, show that from 0° to 30°C. evaporation increases with the temperature. Below 0° a congelation occurs which prevents loss of water. The loss does not increase in proportion to the duration of refrigeration, but is more marked at the beginning. Water loss is however proportional to the meat surface exposed, to the kind of meat, to different cooking methods and to the hygro-metric state of the refrigerator. The more moist the cold the less evaporation occurs, but meats exposed to moist cold were already altered after 24 hours and had a characteristic musty smell. The water losses in a moist or dry medium are correlated also with the kind of meat and its treatment.

The following results were obtained in the writers' experiments:—

##### *Losses of water in refrigerated meat at different temperatures.*

	Temperature	Loss of water
Raw beef exposed to cold for 24 hours . . . . .	+ 8° C	8.1 %
	+ 3° C	4.5 %
	— 4° C	4.0 %

##### *Losses of water in refrigerated meat in relation to the surface exposed.*

		After 30 hours	After 4 days	After 7 days
Mean of 6 experiments between + 2° and + 4° C.	Raw beef in 1 piece . . . . .	8 %	11 %	26 %
	Raw beef in 3 equal pieces . . . . .	17 %	32 %	50 %
Mean of 3 experiments between + 3° and + 6° C.	Cooked pork in 1 piece . . . . .	9 %	26 %	38 %
	Cooked pork in 3 pieces . . . . .	15 %	38 %	45 %

The richer in water a meat is by nature the more it loses during its stay in the refrigerator. Thus meat of different animals does not lose the same amount of water in

the same time. Thus in one experiment in which meat was placed for 3 days in a refrigerator at  $+3^{\circ}\text{C}$ , mutton lost 17 % of water, beef 19 %, pork 20 % and veal 21 %. (*Comptes rendus des Séances de la Société de Biologie*, Paris 1932, No. 2).

**REFRIGERATION OF FISH.** — The difficulty of preserving fish at low temperature is that it is found by experience that the ordinary methods of refrigeration are not effective. Congelation is too slow. On the other hand in too dry air there is great wastage and autolytic phenomena set in more rapidly than with ordinary ice. Satisfactory results have been obtained on several Rochelle trawlers with the DARL-KJORSTAD rapid freezing system. The fish is rapidly frozen by being placed close to fresh brine obtained by mixed natural ice and salt, preservation is then in a cold and moist atmosphere.

Amongst the other systems tried with success are to be noted the common Russian method with sprayed brine, substituting frozen sea water (frozen at low temperature) for freshwater ice and installation of a small refrigerator which retards the melting of the ice and maintains a lower temperature. (*Revue Scientifique*, Paris 1912, No. 2).

E. G. & G. S.

## BOOK NOTICES \*

### General.

*Berichte über Landwirtschaft*, herausgegeben im Reichsministerium für Ernährung und Landwirtschaft, Neue Folge, Sonderheft 50: SERING Max, *Die Deutsche Landwirtschaft unter volks- und weltwirtschaftlichen Gesichtspunkten*, 954 p., Tabellenanhang 66 p., mit 59 Bildern und 187 Tabellen im Text, 9 farbigen Karter und einer Zolltafel. Berlin 1932, Verlagsbuchhandlung Paul Parey.

[In this work on "German agriculture with reference to national and world economy" Max SERING, in collaboration with the leading experts of Germany, discusses how the German farmer and manufacturer and industrial and agricultural labourer has adapted, and how he should in future adapt, his methods of work and his standard of living to the drastically changed conditions of production and trade brought about by the present economic depression.

In describing and analysing post-war agricultural history the writers endeavour to supply the basic elements for a solution of the problems threatening German agriculture. They have had at their disposal the unpublished results of the committee for investigating production and marketing conditions in Germany and in particular those of the agricultural sub-committee under the direction of Mr. HERMES.

This well-organised series of articles aims at presenting a picture of the present state of agriculture in Germany, its methods, successes and failures; it describes present economic and social conditions on the land with a view to finding a sound basis for solving economic, social and political problems.

From a technical standpoint may be particularly noted the chapter by M. T. ROEMER on the Culture of Grain Crops with special consideration of new developments in growing bread cereals and reduction of production costs, and the chapter on Stock Farming Development and Production by M. J. HANSEN. Other noteworthy contributions are concerned with methods of stimulating agriculture, of increasing yields and at the same time lowering costs. There is a chapter on Plant Protection by M. O. APPEL, on Fattening and Selection by M. T. ROEMER and Mechanisation of Agriculture by M. I. VON BISMARCK.

The volume is illustrated by a number of diagrams and charts. There are annexed also 9 large coloured maps showing the soils of Germany, land utilisation in Germany, distribution of farms classified in regard to size, basic crops, density of population, etc.].

N. G.

### I. and Settlement.

BIGNAMI Paolo., *Tra i colonizzatori in Tripolitania*, Bologna 1931-X, Nicola Zanichelli, IX+286 p., 155 fig.

[The first chapter of this book contains a short account of the Italian Colonies, the rest is concerned with the northern part of Tripolitania.

\* Under this heading are included short synopses of books received for review.

The region dealt with is bounded on the west by Tunisia, on the north and east by the Mediterranean and on the south by a line following that of the Djebel mountains between lat. 31° and 32°. The area of the region is 44,586 square kilometres, which represents only one twentieth of the total area of Tripolitania.

The mean annual temperature varies in the different districts from 18.7° to 21.6°C; in January the mean temperature at Tripoli is 12.5°C, and at Nalut, in the Djebel near the Tunisian frontier, is 6.7°C. The mean July temperature is 25.8° at Tripoli and 29.2°C at Nalut. The annual rainfall is 403 mm at Tripoli and 154 mm at Nalut. Two very distinct seasons are distinguishable: a rainy season from 1 October to 31 March and a dry season from 1 April to 30 September. The percentage of rain falling in the dry season is very low (6.9 %). Three climatic zones may be distinguished.

(1) The maritime zone, with an annual temperature and seasons resembling those of the coast of Sicily. Daily variations in temperature are slight. The predominant winds are from the north. The humidity in summer remains relatively high, rain falls during the winter. The maximum rainfall is recorded at Tripoli, the amount diminishes to the west and east of this town.

(2) The steppe zone. The mean temperature is higher and the daily variations more pronounced. In winter northerly, in summer southerly winds predominate. The humidity is lower, but is higher during the cold season. There is less rain than in the maritime zone, rain falling almost exclusively in winter.

(3) Plateaux zone. The mean annual temperature exceeds that of the first but is lower than that of the second zone; the daily variations are less. Humidity is pronounced during winter and fogs are liable to occur. The winds are similar to those of the second zone. The most important agricultural districts are the Tripoli oasis, the low lying zone of the Zliten and Misurata coast, the Djebel plateau extending from Tarhuma (altitude 430 m.) to Cussabat (375 m.), several other Djebel plateaux such as that round Gasr Garian (717 m.) and particularly the plain of Gefara extending from the Tripoli coast to the great or the Djebel. Descriptions of these different parts are given in their phytogeographical, geological and hydrographical aspects.

From the point of view of land settlement the writer distinguishes zones destined for re-settlement from those to be developed without necessarily settlement.

The Government realising the importance of the agricultural development of Lybia has incorporated the cultivable land in the State property. During the first years of settlement progress was slow because only unclaimed land was incorporated, but since 1922 this principle has been abandoned and in accordance with Moslem practice all uncultivate land is regarded as belonging to the State.

In 1930 the area of State property had risen to 200,000 hectares. The land was selected according to climatic and hydrographic conditions, plant growth, health and means of communication.

All possible efforts have been made to help the planters by contributions up to 28 % of the costs of opening up the land, by founding agricultural credit and an Experimental Station at Sidi Mesri. This Station tries out different crops and supplies planters with olive and almond trees, fruit trees, citrus trees, mulberries and forest species for re-afforestation. Interesting experiments have also been made in fixing mobile dunes and reafforesting steppes.

The fourth chapter is the most interesting part of the volume. It contains a very full description of a dozen farms, showing the difficulties that must be surmounted in transforming the arid steppe soil into productive orchards. The production costs are shown in concrete examples.

It is certain that a careful reading of this chapter will be able to offer great advantages to future planters in showing what to do and what to avoid. The writer has been well advised not to pass over the failures that have occurred, which were in many cases due to excessive initial expenses.

Of the 394 concessions in existence at the end of 1930, 153 have an acreage of less than 25 hectares, 107 of from 25 to 100 hectares, 112 of 100 to 1000 hectares and 23 of over 1000 hectares. The total number of firms occupied up to the end of 1930 in the settlement of Tripolitania was 442, of which 395 had land concessions (254 in the name of private individuals, 124 of unlimited- and 17 of limited-liability companies) and 47 owned the land (39 private individuals, 6 unlimited- and 2 limited-liability companies).

The buildings are for the most part very simple, avoiding luxury. Two types of cattle shed occur, one open and the other closed with very few openings.

When a farm is started the first work is the digging of wells and installing water-raising plant. There are in general two underground water levels, one at a depth varying from a few metres to 18 metres in the central coast zone and from 40 to 44 metres



in the east coast zone of Gefara and in the Azizia district, the other at a greater depth varying from 24 to 78 metres.

The different methods used for raising water are described. They are many and extend from the primitive Arab method (djerba) to the most modern motor pumps.

After his review of the different branches of agriculture in Tripolitania the writer arrives at the conclusions that the cultivation of early vegetables is to be recommended, that it is to the interest of Italy which must now import a considerable quantity of wool that sheep raising should increase, that mulberry growing and sericulture should be started and that tobacco growing could give good results in the Colony. The growing of grain crops is only of local interest. The crop which gives the highest promise of success is the olive. The writer has no fear of a future overproduction. For the vine the situation is different; Italy herself produces ample supplies for consumption and cannot be a market for Colonial grapes. The writer has more confidence in the culture of the almond than in that of other tree fruits.

This brief summary can give only a very incomplete idea of Mr. BIGNAMI's book, which is notable for its quantity of precise facts and a pleasing presentation of first-hand observation].

W. B.

### Livestock.

EHRENBERG Paul, *Die neuzeitliche Fütterung des landwirtschaftlichen Arbeitspferdes*. Arbeiten der deutschen Gesellschaft für Züchtungskunde, Heft 52, 75 p. Hannover 1932, bei Schaper.

[This handbook on modern scientific feeding of the farm horse, which forms No. 52 of the publications of the German Selection Society, gives in a clear form the results of the most recent experimental work on the subject with special consideration of their practical application on the farm. The writer, who is a Professor of the University of Breslau and well known for his work on horse feeding, aims at treating the subject from a practical rather than a theoretical standpoint and therefore deals only briefly with general principles so as to give space to describing the different feeds and their use in the rations of the various types of farm horse. The alimentation rules are explained by means of formulae of definite rations so that the handbook will be of real service to the practical farmer].

### FORESTRY

#### Notes.

THE INFLUENCE OF FORESTS ON PRECIPITATION. — A recent treatise by HOWARD GRÉN on General Forest Economics, published at Copenhagen in 1931 contains a chapter on the influence of forests on precipitation the contents of which are summarised in the *Hedeselskabs Tidsskrift*, No. 22, Viborg 1931.

The chapter contains three maps of Denmark, the first showing the distribution of forests and planted heathlands throughout the country, the second, the average temperature in Denmark from 1886 to 1925 and the third, the average rainfall for the same period. The consideration of these maps and the accompanying explanations show that the forests and plantations seem to have a certain influence on the local distribution of rain in Denmark. A comparison of the temperature and rainfall maps leads to certain conclusions which are of a certain value for forestry. For example it is known that the spruce flourishes particularly well in certain of the central regions of Jutland and a reference to the two maps reveals that there is a marked difference between temperature and rainfall between these central areas and those in the East and West of the peninsula. The temperature map shows that in a particular region, the average temperature is from 1° to 1.5° lower than in other zones, and the rainfall map indicates that what is practically the same region has a relatively low rainfall of from 550-650 mm. Hence it is not improbable that the excellent development of the spruce and the poor growth of the Scots pine in this region are the result of these conditions. Even allowing for the effects of the sun and wind factors, these maps certainly suggest that the observed facts merit careful consideration.

*Amount of precipitation.* — It is generally known that the air obtains the greater part of its moisture through the evaporation of the sea surface. For the formation of rain the decisive factor is not the relative humidity of the air or the relation between absolute humidity and the maximum humidity which the air is capable of absorbing at

a given temperature. The warmer the air the higher is this moisture content. Hence the saturation point is higher for warm air than for cold and the same rate of absolute humidity gives a different proportion of relative humidity according as the air is cold or not. When the hot air cools, the relative humidity increases until saturation point is reached. If the cooling process continues a great part of the moisture content of the air is liberated and forms rain drops.

Apart from the influence of seasonal changes, chilling of the air is in the first place the result of the fact that the air, for a variety of reasons, is driven upwards, thus bringing about a rarefaction leading to a fall in temperature. Topographical conditions and barometrical variations over seas and continents are thus deciding factors in the causation of rain over the land surfaces of the globe.

Rain is as a rule formed at a height of about 2000 metres in relation to which the height of the forest counts for very little and scarcely differs in this respect from that of ordinary agricultural growths. Hence it is improbable that any special conditions of the temperature of the air within the forest can have any perceptible influence on the actual quantity of the rainfall (ENDRES). This is mainly dependent on the distance from the sea, the altitude of the locality and the direction of the mountain chains. Where the slope of the mountains is in the direction of the warmer seas, there is likely to be a high rainfall as they tend abruptly to drive upwards the warm, damp sea air,

Within the forest itself the lower temperature of the air gives rise, with the same absolute moisture content of the air, to a higher degree of relative humidity than is the case in the open. This fact however can hardly be said to have any real influence on rain formation proper.

As regards Sweden, HAMBERG has estimated that the difference between the humidity of the air within and outside the forest is 3.25 % on the average with a minimum of 1.5 % in autumn and winter and a maximum of 6.5 % in April. Inquiries carried out in Germany have shown that during the summer and under windless conditions the differences may be as high as 13.5 % (ENDRES), and the results of other researches made in France, Denmark (HUFFEL, ELLINGER), Germany, Austria and Switzerland have given similar results.

No exact measurement has been made to determine up to what altitude above the forests this difference persists, but in practice many aviators have found that a perceptible difference in atmospheric currents is noticeable when passing from open country to afforested areas.

*Distribution of precipitation.* — A number of measurements of rainfall inside and outside the forest have been taken in Germany, Austria, France, Sweden and Switzerland. The most noteworthy of these meteorological tests have been made by the Nancy Forestry Research Station which were begun by MATHIEU in 1867 and continued without a break till 1899 (HUFFEL).

The Nancy experiments have proved conclusively that the rainfall in the forest is about 25 % higher than in the open country. This result is not however due to any rain producing capacity peculiar to the forest but to a mechanical action of the atmospheric current. The forest checks for a certain time the wind which brings the rain and in consequence there is more time for the rainfall to continue over the forest and the area in its immediate vicinity. This phenomenon occurs even when the forest area is of quite small dimensions. If on the other hand it were the fact that the forest itself possessed the capacity of producing rain, the result would be otherwise. It is therefore possible that the forest has a considerable local influence on the distribution of rainfall. The possibility of reaching in this way a more equal or an increased rainfall over the different areas of a country depends absolutely on local conditions.

The forest cannot in any way exercise influence upon the varying seasonal amounts of rainfall in the direction of equalisation.

N. J. FIORD (Denmark) who during the last century made a special study of the influence of the forest on the amount of rainfall, came to the conclusion in 1867 that this influence was so small that it was impossible to determine in what way it was really noticeable at all. Further research is however necessary, for there is reason to believe that in Denmark the forests have a considerable influence on the local distribution of rainfall. If, for example, the map showing the amount of rainfall and the map showing the distribution of forests in Denmark are considered, it will be seen that the maximum rainfall is to be observed on the two most extensive forest areas of the country, which are situated in northern Jutland and Seeland. Similar maxima are also to be noted in other areas with abundant forests, while the maximum rainfall to be noted in Sønderjylland has no obvious connection with the distribution of the forests.

R. W.

FORESTS AND TROPICAL WOODS AT THE INTERNATIONAL CONGRESS OF FORESTRY AND TIMBER AT PARIS 1931. — Section 1 (Silviculture and Technology) of Group I (Tropical and Sub-Tropical Woods) of the Paris International Forestry Congress discussed (see notes by Dr. L. CHALK in the *Empire Forestry Journal* 1931, No. 2) the management of tropical forests and the methods of improving their quality. The second Section was devoted to problems of exploitation in tropical countries and included an interesting contribution by M. JULIARD on mechanical extraction. The third Section dealt with maritime transport, the fourth with trade problems such as the introduction of a common unit of measurement, while the fifth was mainly devoted to utilisation, seasoning, etc. and included a paper by Dr. CHANDLER on the utilisation of tropical timbers in Great Britain and other contributions on special uses, such as for cabinet making and veneers.

As regards resolutions, Group I laid stress on the importance and urgency of botanical work, with a view to the production of forest floras, and of research on tropical timbers. Various recommendations were made in regard to the organisation of production in connection with the reduction of costs and the improvement of facilities for loading and shipment. Emphasis was also laid on the necessity for determining a precise commercial nomenclature, supplemented where necessary, by scientific names for all species.

A Committee was proposed with the object of bringing forward concrete proposals on these lines to the next Congress and various suggestions were made as to the steps to be taken to encourage the use of tropical timbers. Specially important was a resolution urging the institution of national committees or syndicates for the purpose of controlling and directing production and imports and of coordinating production and sales.

The interest of the Congress for tropical forestry was greatly enhanced by the highly effective way in which the exhibits of French colonial timbers were displayed. The intrinsic beauty of these woods, the effectiveness of their use for practical purposes throughout the Exhibition and the success they would appear to have found on the market constitutes one of the most permanent impressions left by the Congress. Two points about these timbers were particularly striking — their low price and the absence of any attempt to pass them off as substitutes for old established timbers recognised in the trade.

It was also to be noticed that the use of artificial selling names, such as African teak, has been discarded by the French, every wood having its own distinctive name, usually an adaptation from the vernacular. Thus each wood has become a separate entity with its own special needs in manufacture and its own special possibilities as regards marketing and prices. This tendency was also noticeable in the designs used for these new woods. For example mahogany did not replace oak as a cheaper substitute for furniture manufacture but received entirely new treatment in the matter of design.

Among the timbers which were most in evidence were the following: — Bossé, *Guarea cedrata*, Ivory Coast; Okoumé, *Aucoumea Klaineana*, Gaboon; Avodiré, *Tournefortia africana*, Ivory Coast; Iroko, *Chlorophora excelsa*, West Africa; Bubinga, *Didelotia Africana*, Cameroons, and *Didelotia africana*, Gaboon; Rosewoods, *Dalbergia* spp., mostly Madagascar; Mahoganies, *Khaya* spp. and *Entandrophragma* spp., West Africa; Padauk, *Pterocarpus* spp. (mostly Maidou *P. pedatus*), Makoré, *Mimusops Heckeli*, Ivory Coast; Fraké, *Terminalia superba* and Framiré, *Terminalia ivorensis*, Ivory Coast; Dibetou or Gaboon walnut, *Louoa Klaineana*, West Africa; Ayous, *Triplochiton scleroxylon*, West Africa; Borassus palm, Zingana or Zebrano, *Cynometra* sp., Cameroons, Gaboon; Nianjou, *Tarrietia utilis*, Ivory Coast; and Ebonies, *Diospyros* spp., West Africa and Madagascar.

These woods were, however, mostly of the ornamental type and frequently used as veneers.

R. W.

FOREST MANAGEMENT AND POLICY IN CZECHOSLOVAKIA. — The areas under forests in Czechoslovakia may be classified under two groups, the first belonging to Bohemia, Moravia and Silesia and the second to Slovakia and Sub-Carpathian Russia. The three first named provinces have been treated in accordance with the principles of scientific silviculture for a much longer period than the other two and, as a result, the statistics for these provinces are naturally the more accurate.

The total forest area of the Republic is 4,662,790 hectares or 33.15 % of the total. In 1920 this area was distributed as follows: State forests, 713,384 hectares; forests belonging to endowed estates, public establishments, etc. under State management,

27,297 hectares; forests belonging to rural communes and villages, 436,143 hectares; forests belonging to communities, 431,964 hectares; forests belonging to churches, religious orders, etc., 270,466 hectares; forests belonging to schools, 1,914 hectares; privately owned forests, 2,648,263 hectares. Since 1920 however the State-owned forests have been increased by 561,000 hectares under the scheme of Forestry Reform.

This Reform began in 1918 and, by the end of 1930, decisions had been made, covering 1,908,000 hectares of forest lands. Of these 561,000 hectares were assigned to the State, 119,000 transferred to other owners, 776,000 hectares left with the original owners, while as regards upwards of 452,000 hectares the awards were to be made during 1931.

At the present time in round figures the area of the State forests amounts to about 1,274,384 hectares, equivalent to 27 % of the total forest area.

*Composition of the forests.* — There are 2,330,792 hectares of conifers, 1,274,365 hectares of broad leaved trees and 666,003 hectares are mixed forest.

*Regime.* — The high-forest system is applied to 3,902,413 hectares, 41,051 hectares are under coppice-with-standards system and 310,118 hectares are simple coppice.

*The average rotation* varies from 83.2 years in Moravia to 96.2 years in Sub-Carpathian Russia.

*The average annual increment* for the forests of Czechoslovakia as a whole is 3.4 cubic metres.

Taking into account the annual increment, production may be estimated as follows : hardwood timber, 946,000 cubic metres; soft wood timber 6,549,000 cubic metres; hard wood fuel, 3,621,000 cubic metres; soft wood fuel, 3,524,000 cubic metres. Czechoslovakia does not impose import dues on imported timber, though there is an exportation duty on certain classes of timber.

The total annual average of timber exports during the period 1921-1930 amounted to 265,000 tons, the equivalent of 5,690,000 cubic metres of growing stock. On the average 50,000 tons of timber are imported annually.

The timber trade is in the hands of three Timber Exchanges at Prague, Olomoric and Bratislava and also of private associations of forest owners, among which the most important is the Central Committee of the Private Forest Associations at Prague. This Society supplies its members with the most recent information on prices and tendencies on the Timber Market and also considers and watches over their general trade, legal and political interests. The above data and information have been extracted from an article by Dr. LEOPOLD HUFNAGL, entitled "Forstwirtschaft und Forstpolitik in der Tschechoslowakischen Republik, *Tharandter Forstliches Jahrbuch*, Berlin 1931, vol. 7.

R. W.

COMPARATIVE CARBONISATION TESTS IN SWITZERLAND. — The "Société Suisse pour l'Étude des Carburants" has recently published a report on the comparative carbonisation tests that it carried out in the Marchissy forest (Jura Vaudois) during 1930. (See Supplement to the publications of the Société forestière Suisse, published by Büchler and Co., Berne 1932). It was proposed to make a study of the utilisation of the residues of forest fellings for the production of charcoal to be used as a fuel in the place of petrol, account to be taken of the following points; technical methods, financial advantages and the possibility of obtaining an average yield of charcoal annually over any given area of mountain forest.

The material used in the trials consisted for the most part of fir branches and crowns and to a less extent of the results of the thinnings of broad leaved stands which were unsaleable and would be wasted, as is almost always the case with the felling residues of mountain forests.

Approximately 287 steres out of a total of about 380 steres which represented the residues and refuse resulting from the handling of the results of a felling of large conifers producing 1150 cubic metres of timber were used in the experiment. The material was treated as to 97 steres in ordinary kilns which gave an average of 74.5 kg. of charcoal per stere and as to 190 steres in three portable metallic charcoal burners, each containing 2-3 steres which gave on the average 59 kg. of charcoal per stere with a maximum of 66 kg. for annular burners and a minimum of 48 kg. for panel burners.

The reporter on these trials states that the difference in yield under the two systems is to some extent to be explained, particularly in the case of panel burners, by faulty closure of the plant, which considerably increased the content in ash in the mass under process of carbonisation. In any case, speaking generally, it appears necessary to encourage among the manufacturers the present tendency to construct their burners so that in practice they can be worked in the same way as the kilns in which the draught

enters at different levels starting from above. In consequence of the draught from above in the burners it happens that the upper layers which were the first to be carbonised are superdistilled with a consequential reduced yield of carbon. In panel burners of the "Simplex" type the regulation of the draught in the sections requires to be completed by a detachable cover so as to allow the settling of the mass to be followed. Ring burners with their multiple air regulation system give the most reliable results. It may be stated as a result of these tests that it should be possible to manufacture in Switzerland an improved form of burner with a satisfactory yield of charcoal and quite suitable for transport and for use in mountain districts.

Physical and chemical tests of charcoals made with the residues of the fellings of conifers have proved that they possess all the qualities that can properly be expected in a good wood charcoal fuel.

As regards the possibilities of the charcoal yield for a given area of mountain forest, the experiments have shown that it is perfectly feasible to obtain in Switzerland a ton of charcoal for every 15 hectares of conifer forest by utilising annually for the purpose the residues of the fellings and a certain amount of the small kindling wood, which has little market value. If this typical rate of production could be obtained from the whole area of the mountain conifer forests in Switzerland, the country would be able to manufacture a total of 40,000 tons of solid fuels annually, representing the equivalent of one fifth of the national imports of petrol.

The report concludes with the statement that, in case of necessity, Switzerland could easily make itself independent of imported petrol. Granted that the supply of forest gas to gas generators for traction purposes must be limited to heavy work, even so in this way there would be a safe market for the charcoal which it is possible to manufacture by utilising the material supplied by the fellings which is at present completely wasted in the mountain forests.

S. C.

COMPARATIVE TESTS, THEORETICAL AND PRACTICAL, OF THE USE OF CHARCOAL GAS AND PETROL IN MOTOR TRACTION. — In order to test the comparative value of charcoal gas and petrol for use with motors, the Engineers' Academy of Science (*Ingenjörsvetenskapsakademien*) at Stockholm was requested in March 1931 to make a series of technical and practical trials with different types of lorries driven by gas motors. These tests have not yet been concluded but a public demonstration of the results already obtained has been given at the Higher Technical School at Stockholm and they are described in the review *Skogen* No. 1, 1932, published at Stockholm.

These experiments included laboratory research as to the calorific value of the different kinds of gas as well as trial trips with lorries of the following types: a French Panhard, built for working on charcoal gas, a Scania-Vabis fitted with a Svedlund charcoal gas generator, a Ford with a detachable Widegren charcoal gas generator and a Chevrolet with a detachable Widegren generator using small timber. A Fordson tractor with a Svedlund generator was also tested. The journeys were made in conditions as far as possible corresponding to those of ordinary daily practical work. The results obtained by the Engineers' Academy have clearly shown that the vehicles driven by generator gas cannot compete with those for which petrol is used, a fact which had already been demonstrated by laboratory work, but clearly does not prove that use of charcoal gas as a motor fuel should be condemned. It would be difficult on the strength of the experimental results hitherto obtained to express any general opinion as to the values of the different patent fuels.

The matter of compression represents a very important element in the working of a motor and the greater its degree the higher is the output. The use of charcoal gas allows a higher degree of compression than petrol and thus there is some set-off against the specific advantage of the latter, particularly in the case of a motor which readily tolerates high compression. A Panhard lorry of the same type as that used in the Stockholm tests has worked excellently in actual practice during a long period in the province of Scania while the good results shown by the Svedlund generator encourage the hope that a good Swedish camion fitted with a gas generator will gradually be evolved.

Even though the precise degree of economy that can be realised through the use of charcoal gas has not as yet been determined, the difference of cost between petrol and charcoal gas is so marked that there can be no question of the absolute superiority of "forest gas" from this particular point of view. In this regard, "forest gas" is clearly superior to heavy oil.

According to a statement by the Minister of Agriculture a Fordson tractor with a gas generator attachment used for ploughing on a farm gave results quite as satisfac-

tory as those of a Fordson petrol tractor and in the first case the cost of fuel (charcoal made on the farm itself) was only 60 % of the cost in the second.

The Scania lorry (with a full load, gross weight of lorry over 6 tons, average speed 48 kilometres) consumed on a journey out and home of 430 kilometres, 176 kg. of charcoal. The quantity of petrol required for the same journey would have amounted to 134 litres

R. W

### Book Notices \*.

AGOSTINI A. *Capre e boschi*, 1 vol., oct., 102 pp. Rome 1932, Arti Grafiche Fratelli Iacelli.

The writer has made a detailed study of the question of the feeding of goats in the forests of Italy and describes the actual condition of affairs before the intervention of the present Government. The writer, who had access to a great variety of documents, shows that after the war the general average increase in the number of goats in the world as a whole amounted to 14.4 %, the average for Italy being 13.3 %. Control of the feeding of goats in Italy was particularly difficult on account of the great variety and ill defined character of rights of usage in connection with communal forests. The necessity for bringing about a gradual reduction in the head of goats grazed in the forests was also urgent in order to keep in proper conditions the majority of the Italian forests essential for the proper maintenance of the hydro-geological system of the national territory. The writer goes on to describe the results obtained through the working of the Decree of 16 January 1927, which introduced a compulsory tax in all communes on the goats turned out to pasture in the woods or protection thickets. The results proved quite satisfactory and by comparison with the figures for 1918 there was a reduction of 44 % in the number of goats.

The writer, in giving an account of the steps taken at different periods to check the increase in the number of goats pastured in the woodlands, observes that a general tax on goats has given results which are relatively rapid and conclusive. In view of the coordinated efforts now being made by Italy to develop to the full the utilisation of the whole territorial area of the country, the upland shepherds will be required to use animals which will be less dangerous than goats from the point of view of forest maintenance and will receive assistance for this purpose.

S. C.

MIKLASZEWSKI J., *Lasy i Leśnictwo w Polsce* (Forests and Forestry in Poland, Vol. 1, p. 620, Warsaw, published by the Forest Officers' Union of Poland with assistance from the Ministry of Agriculture.

This is the first of two important volumes on the conditions of forestry in present-day Poland. It describes with full statistical data not only the forestry conditions prevailing in the country but also the historical development of its forests over a period of more than a century and draws a comparison between the importance of these forests and of those in other countries. The writer was commissioned by the Ministry of Agriculture in Poland to prepare this work which will be completed in two volumes of which the first only has as yet been published and is the subject of the present notice. It consists of eleven chapters, each of which may be regarded as independent of the others.

Chapter I gives an account of the publications dealing with all forestry questions in the territory belonging to the Poland of to-day as regards recent years as also for the war and pre-war period.

Chapters II, III and IV deal with the area and certain other features of the Polish forests, indicating the changes that have taken place during the last 100 years.

Chapters V and VI give detailed descriptions of the distribution of the forests according to the different classes of ownership and the extent of their property and discuss the relations between the size of individual holdings and their possibilities from the technical standpoint.

Chapter VII supplies information on the situation regarding land and water transport of forest products and the effect on prices of these different forms of transport, together with references to timber storage and timber exports and the policy adopted in this latter connection.

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\* Publications presented to the Institute.

Chapters VIII, IX and X describe the forest trees themselves, their increment and age classification (1).

The last chapter contains a detailed description of the natural distribution of the different types of stands and the various types of plants which are characteristic of the soil of all the more important land masses of the country in relation to geological formation and the quality of the soil.

The volume is illustrated and enriched with 137 fine photographs, and a number of maps showing the distribution of the principal species of forest trees, the situation of the forests, the waterways, etc. together with charts indicating the extent of the water transport of timber, of timber exports, etc., numerous plans and graphs, the whole serving to explain and illustrate the text and giving additional interest to a very handsome and valuable treatise.

G. L.

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# MONTHLY BULLETIN

## OF

### AGRICULTURAL SCIENCE AND PRACTICE

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No. 5

#### GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

##### Miscellanea.

##### CROPS OF TEMPERATE REGIONS.

**DELAYED GERMINATION IN CEREALS.** — Although the seeds of cereals are commonly regarded as being easy of germination, yet samples of wheat, oats and barley are frequently found which do not give complete germination within the standard testing period of 12 days. Almost invariably such samples are from newly harvested grain, and so far as New Zealand is concerned is confined almost wholly to oats and barley. This delay may be due either to heating in the stack or to incomplete maturity.

Samples of newly threshed oats and barley were tested in 1931 which showed only a very low growth-percentage, frequently under 10 %. Yet if this seed was retained for 2 to 6 weeks it gained the ability to germinate normally. The phenomenon is due to the fact that, although the seed is to all appearance ripe at the time of harvest, it is not yet physiologically ripe and some time has to elapse before the after-ripening processes are completed. With special laboratory treatment the after-ripening process in wheat and barley can be brought to completion in a few days, when the seed will germinate normally; but in the case of oats the samples have to dry out without assistance before a normal germination can be obtained.

Care should therefore be taken in the sowing of newly harvested cereals and if the laboratory growth is low the seed should be stored under dry airy conditions for at least one month. (N. R. FOY, *The New Zealand Journal of Agriculture*, 1932, Vol. 44, No. 2).

**NATURAL CROSSING IN WHEAT, OATS AND BARLEY.** — An investigation of crossing in wheat, oats and barley was carried on over 5 years at Saskatoon, Canada. The average amount of natural crossing in wheat was 0.88 %, with a range of from 0 to 2.16 %. The average for hulled oats was 0.07 %, with a range of from 0 to 2.0 %, and for the hullless variety 'Liberty' 3.68 % with a range of from 0.51 to 9.82 %. The average for awned barley was 0.07 % with a range of from 0 to 0.17 %.

While the differences between crops and species were large, seasonal effects did not appear to be very important. However the results seemed to indicate for wheat and barley a greater propensity for natural crossing under humid conditions than under dry conditions. (J. E. HARRINGTON, *Scientific Agriculture*, Ottawa 1932, Vol. 12, No. 8).

**ON THE POSSIBILITY OF SUGARBEET SETTING SEED IN THE FIRST YEAR IN EGYPT AND OTHER REGIONS WITH A SIMILAR CLIMATE.** — It has been found that in certain countries such as Egypt and Rumania with a special climate, beet never 'bolts' in its first year. In the *Comptes rendus de l'Académie des Sciences* (8 April 1932) M. O. MUNERATI states that having separated certain strains of beet with a marked tendency to an annual habit he desired to determine whether the tendency would be retained in the climatic conditions of Egypt or, at any rate, in countries further south than Italy. Seeds of the specially selected strains were sown in Morocco and in Egypt; at Rabat 100 % of the beet set seed and in Egypt 40 %. Both in Morocco and in Egypt seed of the ordinary biennial type sown for comparison in every case retained its biennial habit.

It is thus shown experimentally that a type with a marked tendency to an annual habit retains the tendency in regions where 'bolting' in the first year has never been known.

**POTASH IN SUGAR BEET JUICE.** — The varieties of sugar beet now grown have juice with a considerably lower mineral content than earlier varieties. At the time of harvesting they contain scarcely more than 3 % of ash. The sugar industry has encouraged the development of strains rich in sugar and this selection has been at the expense of the mineral content, which indicates an antagonism between ash and sugar.

Georges VILLE observed in 1875 that the juices most rich in sugar were the least rich in minerals and contained more lime than potash. In the juices analysed by the writers practically the whole of the potash was in the form of acid organic salts. From the analytical results obtained it was concluded that there is nothing to suggest that potassium plays a direct role in the elaboration of the stored saccharine; consequently there is nothing to recommend the use in sugar beet growing of heavy applications of potash fertilisers, as has been advocated by certain agronomists. (M. COLIN and P. BILLON, *Comptes rendus de l'Académie des Sciences*, 29 June 1931).

**STOCK INFLUENCE WITH *Lycium vulgare* GRAFTED ON THE TOMATO.** — In the *Comptes rendus de l'Académie des Sciences* of 29 March 1932 M. C. T. POPESCO discusses the influence of stock on scion. He finds that *Lycium vulgare* behaves differently according to whether it is grafted on the pimento or the tomato. In comparative experiments the *Lycium* was grafted on pimento and on the tomato was vigorous and developed better than the controls.

A new process of grafting was used which was named 'grafting by inclusion'. To act as scion a piece 1 to 5 cm long with well-formed buds in the leaf axils was taken from a young shoot of *Lycium*. The leaves were cut off, then the stem was slit longitudinally removing the vascular tissue with care not to injure the buds — a point which is essential to the success of the graft. A longitudinal slit was made at about the middle of the stem of a tomato plant 20 cm in height and the prepared slip was then inserted and the graft bound with raffia or thread.

The result was excellent: the *Lycium* made good growth, as did also the tomato stock which had not been cut back. When growth ceased the *Lycium* had an average height of 2.95 m and a diameter of 1.4 cm.; the tomato stem was 2.5 m in height and 1.8 cm in diameter. The leaves of the grafted *Lycium* were larger than those of the control plants.

The experiments were repeated three years in succession and the remarkable point was the change in the inflorescences and fruits of the *Lycium*. The fruits of *Lycium* are normally small, oval, solitary or grouped close to the stem that bears them, while tomato fruits are larger and borne on comparatively long peduncles arranged in cymes. Whereas the fruits of the control plants of *Lycium* retained their normal characteristics the grafted plants produced large, elongated fruits arranged in divergent cymes, thus coming to resemble more closely the tomato. The pulp of the modified fruits had also undergone an interesting alteration, becoming softer.

These facts show that Solanaceous fruits are affected by the plant on which they are grafted.

**CONTRIBUTION TO THE BIOLOGICAL STUDY OF THE ALKALOIDS OF TOBACCO.** — M. J. CHAZE describes (*Comptes rendus de l'Académie d'Agriculture de France*, 1932, No. 7) his investigation methods in studying the localisation of nicotine in the plant and its formation in the cell. He finds that the seed contains no alkaloid in its active parts. Nicotine makes its appearance in each cell undergoing division. It occurs in all the living cells except the vessels and functioning sieve tubes; in adult plants it passes towards the periphery while continuing to be formed in the phloem parenchyma. The nicotine content falls in etiolated seedlings owing to defective nutrition, and in plants after pollination. It is formed invariably in the vacuoles as soon as they appear. Experiments on the germinating seed showed further that nicotine makes its appearance in aleurone grains undergoing liquefaction. A study of the epidermis showed that there is a nicotine containing exudation. This explains the disappearance of the alkaloid and this part thrown out by the plant must be regarded as a waste product of metabolism.

**RELATIONSHIP BETWEEN THE RICHNESS OF THE SAP IN RESERVE MATERIALS AND THE FRUITING OF VINES.** — Perennial plants such as the vine ensure the development of the buds in spring by accumulating in them the reserves from the preceding year and, unlike annual plants, form their reproductive organs as soon as growth begins. These reserve materials in the vine favour a better opening of the buds or a better development of the grapes. As a result of a number of analyses of samples taken from an experimental vineyard it appears that the sap of the 'Gamay' vine is nearly always richer

than that of the 'Chemin'. Analysis of the sap which flows from a cut explains the difference existing between the products stored and the products utilised by the plant in cellular growth and bud development; the greater the development of the plant the less is the residue of reserves in the sap and *vice-versa*. From 22 to 24 March 1922 the sap of the 'Gamay' contained 25.7 gm of glucose per litre and that of the 'Chemin' 13.1 gm. In the vineyard these two vinestocks which have been grown side by side for 30 years in the same conditions and with similar pruning are unequal in bearing: the 'Gamay' gives an average of 24 bunches to the shoot and the 'Chemin' 14. It is thus reasonable to conclude that the buds of the 'Gamay' having at their disposal a greater quantity of assimilable substances are better nourished than those of the 'Chemin' and therefore set more fruit. Artificial enrichment of the sap of 'Chemin' with glucose (3 to 8 gm per shoot) and asparagine (0.3 to 0.4 gm) resulted in a marked increase in the number of bunches. The richness of the sap in assimilable substances, particularly in carbohydrates, when the buds are forming and developing would thus appear to be an important factor in the fertility of the vine. High yielding varieties would seem to be those which mobilise readily their reserves and feed the buds abundantly during their formation and development. (P. VIALA, L. MOREAU and E. VINET, *Comptes rendus de l'Académie d'Agriculture de France*, 10 February 1932).

D. K.

## TROPICAL AND SUBTROPICAL AGRICULTURE

### Review of the more important publications on rubber culture issued in 1931 (Part I) (1).

#### BOTANICAL INVESTIGATIONS.

An extensive investigation has been carried out by S'JACOB (1) on the effects of artificial pollination of hevea-flowers. In total 7967 cross-pollinations were made with a success of 7.3 per cent and 6226 self-pollinations with a success of 6.1 per cent. The success was thus only a little less in self-pollination than in cross-pollination and the general idea that successful self-pollination is rare seems therefore to be erroneous. It follows that there is no reason to think that in nature self-fertilisation is an exception and cross-fertilisation the rule.

The pollination of flowers which had been already open for more than one day gave a smaller percentage of success. Pollen from closed flowers was nearly as good as from open ones. No difference was found whether pollination was carried out in the morning or in the afternoon. Isolation of the pollinated flower by means of a plug of cotton (Heusser method) was found to be nearly as good as isolation with a muslin bag.

The ripening time of the seed was found to be different for different combinations of pollen and mother-trees; it varied between 139 and 193 days. The same may be said of the germinative power; the average of 40 combinations was 82 %, which is not much below that of illegitimate seeds. The germinating energy was also different; after 12 days it varied between 8 % and 86 %.

VAN DER HOOP (2) investigated the seed of different clones and found an average germinating time of 17 days; it varied between 14 and 29. The germinating power of seeds of mother-trees was 86 % and that of seeds of clones 95 %. It is interesting that the percentage of void seeds is much larger in budgrafts than in seedlings. For the budding practice it is useful to know that 100 seeds give as an average only 50 well developed plants; as the average success in budding is only 60 %, 100 well developed stocks give only 60 budgrafts; of the budgrafts 20 % have

(1) For previous reviews see this *Bulletin*, 1931, No. 6, pp. 212-218, and No. 7, pp. 258-269

to be eliminated on account of insufficiently developed roots ; after transplanting at least 15 % of the budgrafts have again to be supplied. From these figures it appears that 230 well developed seedlings or 460 seeds are needed to obtain finally a field of 100 budgrafts.

OSTENDORF (3) called attention to an undesirable form of branch-development in Clone Ct. 88. This clone is rather liable to damage by wind and it is a common occurrence for large branches to be torn off. An investigation of the way in which in this clone the branches are attached to the stem reveals that the tissue of the branch is not intimately connected with that of the stem. Figures given by the author demonstrate this situation clearly.

The arrangement of the leaves — the so-called phyllotaxy — was the subject of an exhaustive investigation by OSTENDORF and RAMAER (4). It was shown that in the bud the phyllotaxy is characterized by the  $(2 + 3)$  system of parastichies and by a divergence of about  $138^\circ$ . In a minority (8 %) of the buds another phyllotaxy was observed ; here the characteristic parastichies form a  $(3 + 4)$  system and the divergence is about  $103^\circ$  or in the neighbourhood of  $2/7 \times 360^\circ$ . In the fully developed shoot the phyllotaxy is the same, a normal shoot developing from the bud without any appreciable twist. It would be beyond the scope of this review to go more in detail into this problem.

Well defined morphological differences between different clones are always useful ; they may serve in dubious cases to identify the clone to which a tree belongs. BOBILIOFF (5) found that there are differences in the amount and in the quality of enzymes in the latex of different trees or clones. This is apparent when some drops of a one per cent solution of chloride of calcium are added to a few drops of latex. Soon the first colour changes begin to appear ; these vary in intensity in different clones and show all sorts of nuances, such as orange-yellow, light violet, and red. After a certain time, other colours begin to appear, viz, violet, blue, and sometimes a greenish colour. These become darker, until a black, dark blue or grey-black colour is attained. The character of the discoloration is typical for the clone and in the different trees of one clone it is fairly constant, but small variations may occur. Latex from young leaves is most suitable for the purpose ; it is advisable to take a few drops of latex from the leaf scar. The reaction is also obtained with latex from young bark which is still green. Latex from bark which is already corky, is not suitable.

An abnormality, shown by a number of clones is polyphyllly, *i. e.*, the development of more than 3 leaflets, especially in young plants (6). For some clones polyphyllly is reliable as a clonal character, for instance for clone AV/71, which develops in many of its leaves a fourth rudimentary leaflet. A most remarkable instance of polyphyllly occurs in clone AV/183 ; this clone shows a 4th leaflet, which remains stunted and grows backward. The opposite symptom, viz., leaves with only one or two leaflets ("oligophyllly"), is found in some clones : in clone AV.185 many leaves of the first flush of young buddings have only one or two leaflets. A similar abnormality is shown by clone AV.214 (7).

The idea of Jules BOSCH (see this *Bulletin*, 1931, No. 7, p. 259 T), that the hevea tree usually develops 4 main lateral roots and that it is of importance to apply the tapping panels just above these roots, induced GANDRUP (8) to go more thoroughly into the question of the arrangement of the lateral roots ; for this purpose some 100 trees were investigated in West Java and an equal number in East Java. It was found that in young trees rather constantly 12 lateral roots are formed but that not all these develop further : in West Java the number of lateral roots in old trees varied between 2 and 10, with an average of  $5.98 \pm 0.06$ , while in East Java the

number varied between 5 and 14, with an average of  $8.8 \pm 0.09$ . The idea of Jules BOSCH is thus shown to be incorrect.

The formation of adventitious roots on deeply planted seedlings was studied by SNORP (see under 'Selection').

After the extensive investigation of FREY-WYSSLING, which was discussed in the previous review (*Ibid.*, 1931, No. 6, p. 214 T), it may be stated that the measurement of the diameter of latex-vessels as a means of selecting the best yielding plants (ASHPLANT) cannot be considered to be of practical value. This same conclusion was reached by CRAMER (9). In a letter to the *Planters Chronicle* (of South India) ASHPLANT replied to his critics (10). His opinion was that the small correlation coefficient between latex tube bore and yield found by FREY-WYSSLING — 0.54 against 0.75 found by ASHPLANT — is partly due to the small number of trees examined and partly to the fact that he did not include in his investigation trees with tube bore of less than 14 microns.

#### PLANTING AND THINNING OUT SYSTEMS.

The theory that the present thinning out systems are in general too drastic and that a greater number of trees per hectare than is generally adopted gives higher returns — see TENGWALL's statistical investigation, mentioned in the previous review (*Ibid.*, 1931, No. 6, p. 215) — was confirmed by an experiment at Soewarna estate in Java (11). In a field of this estate, planted in 1918-19 with seedlings of selected trees of Kiara Pajoeng and experiment was carried out in which 4 thinning out systems were studied each in 6 plots of 1 bahu (0.71 hectares). The trees were standing irregularly. In 1927 the trees of the 4 treatments were thinned out, those of series A and B to 250 trees per hectare, C and D to 215 trees; in May 1928 the trees were finally thinned out, so that in series A 250 trees remained per hectare, in series B 215 trees, C 175 and D 140 trees. Taking into account the differences in yield between the different series before the thinning out was effected, the following differences in yield per hectare were recorded for the 27 months (June 1928-Sept. 1930) that the experiment lasted:  $A-B = 36.1 \pm 8.5$  kg.,  $A-C = 60.8 \pm 21.7$  kg.,  $A-D = 70.7 \pm 25.3$  kg. The conclusion is thus, that thinning out of the 12-year-old trees to less than 250 trees per hectare was unprofitable. The fewer the number of trees remaining, the greater was the loss in rubber. In the three experimental years the relation to the increase in yield of the strongly thinned out fields (B C, and D) to the increase in yield of field A did not improve and remained practically the same; in other words the increase in yield per tree was practically the same, in the fields with 250, with 215, with 175 and with 140 trees per hectare. The bark renewal was somewhat quicker in the fields with a small number of trees, but it is not to be expected that this will in the future have a marked influence on the yield. The experiment thus gives support to the theory that it is not profitable to thin out to a smaller number than 250 trees per hectare.

For budgrafts DE BUY WENNIGER came also to the conclusion that a closer planting system is advisable (see below under 'Selection').

It is still a disputed question whether clones should be planted in fields of trees of one clone (block or monoclonal system) or in mixed cultivation of different clones. The directors of the Rubber Experiment Stations in Java (12) gave a report on the present situation in which the advantages and disadvantages of both systems are discussed. Against planting in monoclonal system no objection can be made for the clones which have been thoroughly tested and proved to be recommendable as regards yield and other qualities. For the clones which seem promising but which

have not yet been thoroughly tested, mixed cultivation of at least 8 clones is strongly advised so that the undesirable clones can be thinned out without leaving open places which have to be replanted.

The most important advantages of the monoclonal system are held to be that the tapping system, the control measures against diseases, and also other cultural methods can be made uniform for the whole field and well adapted to the clone. The advantages of the polyclonal system are : — (1) selective thinning out will probably result in a higher ultimate yield, (2) it gives an opportunity of getting profit from the results of the selection work with little risk. It is recommended to plant mixed clones in diagonal rows.

The same subject has been discussed by MANN (13). His arguments were mainly the same as those of the Directors of Experiment Stations in Java.

#### MIXED CULTIVATION.

As mentioned in the previous review (*Ibid.*, 1931, No. 6, p. 218 T) we have little information about the influence of interplanting of robusta on the yield of the hevea-fields, but the statistical investigation of TENGWALL gave a strong indication that mixed cultivation of hevea and robusta is not entirely without influence on the production of the hevea. We know little more about what profit can be expected from the interplanted robusta. The report of SCHWEIZER (14) about the experience gained in East Java with mixed plantations is therefore very welcome.

It is an opinion very generally met with, that coffee used as a catch crop in combination with rubber must be removed after a few years. SCHWEIZER is of opinion that it may be profitable to keep the rubber and coffee much longer combined than is generally done, provided that care is taken to give the coffee in later years sufficient sunlight by thinning out and by pruning the rubber trees. In East Java we find several estates with 20-year-old rubber and coffee trees in mixed cultivation where the hevea-trees have been planted 24 feet by 24 feet and the coffee is standing in 3 rows between every two rows of hevea, the hevea trees having been pruned in time. SCHWEIZER gives figures of the yield of a number of rubber-with-coffee fields and of adjacent fields where coffee and rubber have been planted separately. A few examples of the yield of the mixed fields in comparison with that of the unmixed fields are given here :

1. The field was planted in 1916 and the yield was recorded in 1928 :—  
 unmixed 553 kg rubber per ha  
           5.3 picul coffee per ha  
 mixed 382 kg rubber and 3.1 picul coffee per ha
2. the field was planted in 1911-12 ; the yield was recorded in 1928 :—  
 unmixed 407 kg rubber per ha  
           5.7 picul coffee per ha  
 mixed 354 kg rubber and 12.1 picul coffee.

In some cases, as in the last mentioned, we find the remarkable fact that after a year with a prolonged dry season the coffee produced more under hevea shade than under shade of *laintoro* (*Leucaena glauca*).

It may be questionable whether the favourable results of continued mixed cultivation, as recorded by SCHWEIZER, may be generalized for all sorts of soil and climate. It would not be surprising if it appeared that coffee mixed with hevea



will give satisfactory yields during many years only on very fertile soils and that on soils less fertile than those of the estates in East Java investigated by SCHWEIZER the yield of coffee trees mixed with hevea trees will decrease after a few years.

#### SOIL, AND MANURING.

Our knowledge of the influence of manuring on the growth and on the yield, of rubber trees in Java was extended by four extensive reports of experiments.

VOLLEMA (15) published an extensive report on manuring experiments carried out in the period 1914 to 1930 in West Java. The total of these experiments amounted to 58, 4 in nurseries, 12 in young or backward plantations and 42 in tap gardens.

In nurseries two experiments were made with nitrogen-manure. In one case there was no effect, and in one case about 5 % increase in height was obtained. Amounts of 4 to 200 gm of manure (sulphate of ammonia or urea) were used. The optimum dose appears to be about 125 gm per plant, but from other experiments it is evident that often 10 to 20 gm will suffice.

The experiments in young and backward plantations — 12 in total — were carried out in fields with budgrafts and in others with seedlings. The application of nitrogen gave in 2 cases increase in height and in 7 cases no increase; for phosphate these figures were 1 and 5, for potash 4 and 1, for nitrogen + potash 4 and nil, for nitrogen + phosphate + lime 1 and nil. Quantities of 100 to 300 gm of manure per tree were applied; generally speaking 200 gm seem to be a rational dressing. In the experiments with positive results an increase in height of 5 to 10 % was obtained with nitrogen manure (in most cases sulphate of ammonia or nitrate of soda) with phosphate (in most cases double superphosphate) about 10 %, with potash (mostly chloride of potash) 5 to 30 %, with nitrogen + potash 5 to 20 % and with nitrogen + phosphate + lime about 25 %.

In the experiments in "tap gardens" the application of nitrogen gave in 11 cases increase in yield and in 9 cases no increase; for the other fertilisers the figures were as follows:— phosphate 2 and 10, potash 1 and 9, lime 1 and 3, nitrogen + phosphate 1 and 1, nitrogen + phosphate + potash 1 and nil, nitrogen + phosphate + potash + lime nil and 1. The increase in yield obtained from the nitrogen manure was from 5 to 25 %, from the phosphate 5 to 10 %, potash about 5 %, lime about 5 %.

The author states in his summary that apparently the manuring of nurseries, especially when they have been laid out on poor soil, may be very useful in stimulating the growth of young seedlings. As only small doses are necessary, the manuring of nurseries is not expensive.

In young and in backward plantations an improvement of the growth was frequently obtained, so that the manured trees could be tapped at an earlier date than the unmanured ones.

Manuring of tap gardens from unselected seed gave only in a few cases a considerable increase of yield, but even in these exceptional cases manuring was not profitable under present conditions.

In West Java the Government rubber plantation "Serpong" (16) is situated on an old andesite tuff laterite soil, consisting of a red loamy clay of fairly good physical structure, but chemically speaking the soil is poor. Though various green manures were used and the soil was tilled, the trees planted in 1918 and 1919 remained backward.

Various artificial manures and groundnut cake were applied to trees in four plot-series. In the first of these a small effect was obtained with groundnut cake

but none with sulphate of ammonia, nitrate of soda or urea. In the second series the NPK plots distinctly reacted to manuring, the girth of the trees being after three years 129 % of the initial girth against 106 % in the control plots, while the plots with exclusive N manure did not show any effect. In the fourth series no effect was obtained with different doses of nitrate of sodium (417, 834 and 1251 kg per ha). In the third series, which was identical with the fourth, only the heaviest dose of manure had a slight effect.

The manuring experiments of the Besoeki Experimental Station (17) were carried out on estates which are situated on the southern slopes of the Yang mountain and at the foot of the Raung mountain (East Java). The soil contains basalt-andesite material and was considered to be chemically "good" and physically "fairly good to good", but generally there was a want of nitrogen and organic matter. The trees of these estates were unselected seedlings, 15 to 20 years old.

In one experimental series (Bandjarsarie estate) a distinct increase in production was obtained by manuring with sulphate of ammonia. A product of 38.8 kg rubber per month per ha was obtained from the unmanured plots; with an application of 1 kg sulphate of ammonia per tree a yield of 33.7 kg was obtained, with 2 kg a yield of 40.1 kg with 3 kg a yield of 44.2 kg, with 4 kg a yield of 43.2 kg. The gains in production over the unmanured field were respectively  $0.1 \pm 1.9$  kg,  $3.3 \pm 1.1$ ,  $3.8 \pm 1.9$ ,  $5.0 \pm 1.8$  kg.

In the 2nd experiment (Kali Baroe estate) an application of  $1 \frac{1}{2}$  kg sulphate of ammonia gave a small but distinct gain in production of  $2.2 \pm 0.4$  kg (production of unmanured plots 20.4 kg, of the manured plots 23.1 kg per month per ha).

In the 3rd experiment (Kali Mrawan) 2 kg sulphate of ammonia, and the same dose + 50 gm sulphur per tree were applied. No effect of the sulphate of ammonia could be found, but the sulphur caused a small reduction of yield-increase. Production 36.0 kg and 37.1 kg per month per ha.

4th Experiment (Widodaren). Though the soil analysis gave a very low figure for nitrogen content, manuring with  $1 \frac{1}{2}$  kg diammonphos per tree had no effect.

5th Experiment (Glenmore). Applications of 1 kg, 2 kg, 3 kg, and 4 kg nitrate of soda per tree had no appreciable effect. The yield was from 75.2 to 84.0 kg per month per ha in the different plot-series. The effect on the wintering of the trees was distinct: wintering in the manured plots was about 3 weeks later.

6th Experiment (Zeelandia). No effect was found of an application of  $\frac{3}{4}$  kg sulphate of ammonia +  $\frac{3}{4}$  kg diammonphos per tree. Production 46.5 and 45.0 kg rubber per month per ha.

On different estates in the Zuidergebergte (Southern Mountains) in East Java and the slopes of the mountains Smeroe, Kawi and Kloet, the Malang Experiment Station carried out manuring experiments (18, 19). The number of experiments was larger and the tests were carried out partly on trees in nurseries and partly on trees in the fields.

Analyses of soils of the Zuidergebergte generally showed a low percentage of nitrogen and phosphoric acid and a varying percentage of potash, whilst the physical condition of the soil was not entirely satisfactory.

The manuring experiments in nurseries indicated that a full manuring with N. P. K. was equally favourable to manuring with N. P.; on one estate indications were obtained of an equally favourable result with N. only. With small doses the results were less favourable, which may be attributed to the poorer physical condition of the soil, whereby the spreading of the roots was hindered.

On the Kawi soils the results obtained by manuring the nursery-trees with N. P. K. were, it is true, fairly favourable, but, owing to the irregularity of the re-

sults obtained, no definite conclusion could be drawn. With trees in the fields the following results were obtained.

1. On a backward plantation on the Smeroe mountain N. P. K. and Ca were applied in different combinations. The age of the trees is not mentioned. The number of tappable trees was small. A favourable effect could not be found.

2. The same experiment was carried out in a field on the Molio Ardjo estate, planted in 1908 at an altitude of 600-700 m. The quantities applied per tree were : sulphate of ammonia 2 kg, superphosphate  $1\frac{1}{2}$  kg, sulphate of potassium  $1\frac{1}{2}$  kg, (all applied in 3 doses in 1928) and slaked lime 6 kg (applied in December 1927). Further experiments were carried out with green-manuring (*Passiflora foetida*, *Parvira*, *Tephrosia* and *Centrosema pubescens*) with ammophos ( $2\frac{1}{2}$  kg per tree) and with sulphate of potassium ( $1\frac{1}{2}$  kg per tree). The yield of the different unmanured series of plots varied between 28.3 kg and 56.1 kg rubber per ha per month. The yields were recorded over 4 years (1927 to 1930). A distinct gain in comparison with the increase of the unmanured plots was to be seen in the N. P. K. Ca-, the NPK- and the ammophos K Ca-series, which gave in the 3rd year an excess of  $6.2 \pm 1.3$ ,  $4.9 \pm 0.6$  and  $7.7 \pm 1.0$ . From the results of the different combinations of manure it appears that P and Ca have had no influence ; the effect must therefore be attributed to N or K or both.

3. In a second experiment with trees planted in 1912, and with a production of 56.1 and 52.5 kg rubber per month in 1927-28 and 1928-29, no effect was obtained with a N. P. K. manuring.

In the third experiment of trees planted in 1911-12 manuring with N. P. gave a reliable but small increase of production.

It would take too much space to give a complete review of the 6 manuring experiments of rubber fields in the Zuidergebergte, the one experiment on the Kawi and the 2 on the Kloet. The following statement must suffice : the results on the plantations in the Zuidergebergte did not show a definite effect or had no effect, on the Kawi plantations the experiment showed a favourable effect of N. P. K. manuring but no reliable effect on N. manuring, while the two experiments on the Kloet did not allow of a positive conclusion.

A review of the present position of manuring of rubber in Malacca was given by HAINES and FALCONER FLINT (20). This review was illustrated by a description of 14 manuring trials. The most important conclusions reached by these authors are the following.

It may be regarded as a general rule that successful manuring is rarely to be expected when the yield level of the field is not low (400 lbs or more per acre per annum for fields planted with unselected material). On the other hand it is common to obtain yield increases from trees yielding only 200 to 300 lbs or less. With fairly old rubber response is often obtained most readily from trees of good growth and appearance but poor yield. Trees with poor, thin foliage of bad colour show often an immediate response as to appearance, but yield response may be delayed, for the bark has usually been affected.

The experiments in Malacca lead further to the conclusion that little correlation can be discerned between the soil type and response to manuring, which shows that it is almost certainly only a secondary factor. " It may be true to say that successful results are seldom obtained on friable red loam soils ; but since it is equally true that such soils seldom carry poor yielding rubber this secondary factor is included in the primary factor of yield level and vegetative health in its relation to fertilisers. It has emerged that rubber of low yield level growing on certain coastal soils overlaid with peat does not respond to nitrogenous fertilisers. One is tempted to believe

that low yields are here due to some direct inhibiting factor and not to a shortage of available nitrogen. In the case studied drainage appeared to be as adequate as the soil type permitted. It is interesting to note that these areas were planted from virgin jungle. On apparently similar soils which had been for many years under sugarcane or other crops, rubber of similar yield level responded in a striking fashion to sulphate of ammonia".

The manuring experiments were generally carried out on fields consisting of a mixed population of a low yielding capacity. The authors emphasize that the application of fertilisers to high yielding areas of budded rubber will prove a far greater economic success than attempts upon the present mixed population of trees.

A third progress report was issued on the "Block 6" manuring experiment "a 40 acre experiment in Malacca in which cow dung and inorganic manures" were applied (21). The effect of matured cow dung (10.9 per cent girth increase) was much greater than that of the inorganic manures, of which only the nitrogen manure gave a significant increase (4.5 per cent).

A detailed survey of green manuring of rubber in Ceylon is given by MURRAY (22). After a historical introduction a description is given of the green manures and cover crops in new clearings and of the green manures and cover crops under mature rubber; 26 species of green manuring plants are mentioned in this publication.

The number of experiments intended to give definite figures of the effect of green manuring on growth or yield, are few and there is inadequate knowledge on the matter. The experiments of SANDERSON and HAINES (23) in which a comparison was made of the growth of rubber on clean weeded land and on land with a cover crop, give some information on this subject. The tests were made on young rubber plants and the growth was recorded 18 months after planting. During this time the clean weeded plots made consistently better growth than those under a cover crop; in some cases the difference was small, in other cases it was about 23 per cent. This does not mean, of course, that clean weeding would give an ultimate benefit and the advantage in the first years may easily become a disadvantage in later years. A year later — 29 months after planting — measurements of the trees were again made and it was stated that the early differences between the different blocks tend to fade out rather than to increase and that earlier differences due to conditions of cultivation are tending to diminish (24).

#### UPKEEP.

The low rubber prices made it a necessity to find the most economical methods for the different parts of the plantation work; it became also a question of discussion what system of weeding was the most economical. The fields have either a rather clean cover of cover plants, or they have a cover which is already mixed with weeds, or a growth of weeds only. In the first case it was considered sufficient to weed once a year, which means in Java an expense of 3 to 4 guilders per bahu (about 5 guilders per ha). If this is not done the weeds impede the control of the tapping coolies and a loss in rubber results. In most cases, however, the cover is already fairly well mixed with weeds or the leguminous plants are already greatly superseded by weeds, in consequence of lack of care. In this case it is considered by some planters advisable to plant shade trees in the open spaces (25).

Dr. C. J. J. VAN HALL.

(To be continued).

## Miscellanea.

## Rice.

OIL FROM 'HAMBAS' RICE IN THE PHILIPPINES. — The oil is obtained from the hulls of rice of the 'Hambas variety' and is composed essentially of glycerides of oleic, linoleic and palmitic acids. In composition it is very similar to the oils of kapok, cottonseed and ground-nuts. It may be used commercially for the treatment of foodstuffs, soap making and in general for all the uses to which cottonseed oil is put. To produce the oil in sufficient quantity it seems necessary to use powerful hydraulic presses. The extraction of oil may be regarded as an additional source of income for rice planters. (A. O. CRUZ, A. P. WEST and N. B. MENDIOLA, *The Philippine Journal of Science*, 1932, Vol. 47, No. 4).

## Cotton.

THE 1930-31 COTTON SEASON IN THE BELGIAN CONGO. — This season like the preceding one marked a decided advance in the cotton production. There is no doubt that the results would have been still better if the season had been more propitious and if there had not been losses caused by disease and pests. Rainfall was inadequate at planting time and too abundant at harvest time. The diseases and pests which caused most damage were black arm disease (*Bacterium malvacearum*), which necessitated the destruction of about 40 hectares of cotton, and the pink bollworm (*Galechya gossypiella*). All possible means of control were applied to reduce the losses.

The native is becoming accustomed to cotton growing and is taking to it more and more, though European planters are also interested in it, attracted by the considerable and certain profits. It would however be unwise to remove the present supervision of the cotton plantations, for the native in spite of good intentions requires guidance.

The seed improvement scheme is being systematically carried on in the selection stations. A total of 908,762 kg. of selected seed has been produced, of which 200,000 kg. have been re-sown in the propagating zones and 708,762 kg. have been planted in other cotton growing parts.

In the whole cotton growing zone of the Belgian Congo there are about 280,000 planters, about 160,000 of which have not been able to receive selected seed and have had to use locally grown seed.

The harvesting was also inspected in order to avoid the presence of unripe cotton.

The following table shows the recent development of cotton production in the Belgian Congo.

Season	Uélé	Ubangi
1928-29. . . . .	14 924 062 kg	1 195 809 kg
1929-30. . . . .	22 518 775 "	1 275 295 "
1930-31. . . . .	30 380 576 "	2 444 894 "

During the 1930-31 season the experimental studies of the yield per hectare of native plantations were continued. Comparison with the results of the preceding year showed that the yields were about the same. In the poorest savannah soils the lowest yield was 220 kg; in the richest forest soils the yields were from 1132 to 1273 kg.

Sales began early in January and the season closed in the latter half of April. The plants were everywhere pulled up and destroyed as rapidly as possible under the direct supervision of the official staff and before the end of the sales.

Awards in the form of tools, which had become optional in the districts of Uélé, has practically disappeared. Prizes of salt are much valued by the natives everywhere. Chiefs are still awarded 2 centimes per kilo of cotton produced within their jurisdiction. (Annual report on the 1930-31 cotton season presented by F. SPARANO, Director of the 'Propagande Cotonnière du Congo belge', *Bulletin Agricole du Congo Belge*, Bruxelles 1931, Vol. XXII, No. 3).

## R u b b e r .

IMPROVED GRAFTING SYSTEM IN THE REGENERATION OF HEVEA PLANTATIONS. — With a view to diminishing the costs of grafting and if possible improving the yields of the grafted trees, new methods have been tried out and the old routine abandoned.

Experiments have shown that it is not the actual budding but the binding which is the expensive part of the grafting system as regards labour. Thus that part of the technique should be improved first.

The usual inverted V-shaped cut which is made in large trees to prevent the latex flowing over the graft necessitates extra labour and the preparation of the trees in advance. An improvement consists in reversing the position and shape of the incision. The flow of sap is equally prevented and further the graft is no longer liable to be injured by infiltration of water between the bark and the binding. This method makes possible the 'open graft' system.

This system was tried on hevea in 1930. It is a reversed incision graft unprotected against weather except for the usual wreath of leaves. It was suggested by observation of the frequent presence of water or excessive moisture under the waxed binding considered to be watertight, by the rot of the bud-slips and by the necrosis of the bark caused by the paraffin wax.

Close contact between the two cambiums was obtained either by fastening the graft with a band of galvanised iron wire and wooden wedges (see fig. 1) or by a pressing appliance nailed to the bark.

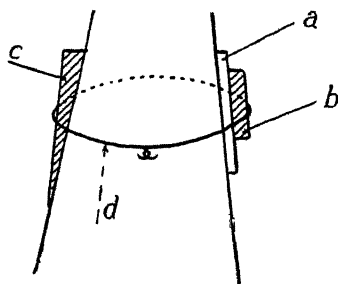


FIG. 1. — Fastening of the graft with a wire band and wooden wedges.

- a = graft
- b = protecting wood
- c = wooden wedge
- d = galvanised iron wire

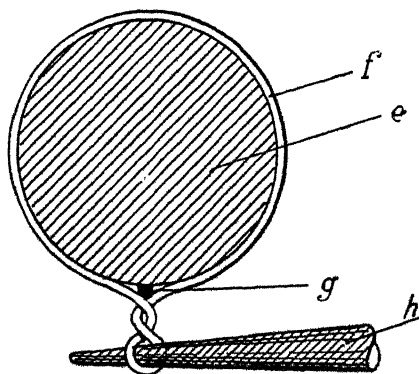


FIG. 2. — Tightening by twisting the wire band with a conical pin ('Garrot process').

- e = section of branch
- f = wire band
- g = bamboo over the graft
- h = conical pin

The latter system was soon abandoned. The other was improved by replacing the wedge by the 'Garrot' system of tightening the wire by twisting. A piece of bamboo is placed over the graft and the loop of the band over that and the latter twisted to tighten the wire and then a conical pin inserted, forcing it sufficiently to apply the necessary pressure (see fig. 2).

By this means 250 grafts may be effected per day, that is to say, twice the usual number. The results are excellent. Further the regeneration of the whole plantation can be carried out in a single operation instead of in 4 as formerly. Thus a considerable gain in the tonnage of latex is obtained without additional cost. (M. PLANCHON, Director of the Michelin plantations, *Bulletin Économique de l'Indochine*, October 1931-B).

**RUBBER CONTENT OF THE BARK OF FICUS SPECIES IN THE PHILIPPINE ISLANDS.** — Analyses of the bark of 24 Philippine species of *Ficus* were made to determine the rubber content. The species were selected from among those growing in the vicinity of Manila and in the Makiling Botanic Gardens. The leaves and bark were air-dried and reduced to a powder capable of passing through a 20-mesh sieve. The content in rubber was determined by the method recommended by HALL and GOODSPEED. The bark of the three following species was found to contain rubber: — *F. calophylloides* Elmer (0.73 %), *F. elastica* Roxb. (3.55 %) and *F. Minahassas* Miq. (0.52 %). The rubber content is liable to considerable fluctuations due more particularly to the age of the tree and soil and weather conditions.

In composition the rubber in these species is very similar to Para rubber (see the following table) ; it contains a considerable quantity of hydrogen carbide ( $C_{10}H_{16}$ ), which is the main constituent of Para rubber.

Species	Carbon	Hydrogen	Oxygen 100—(C + H)	C <sub>10</sub> H <sub>16</sub>
	%	%	%	%
<i>Ficus Minahassae</i> Miq. . . . .	87.16	11.85	0.99	18.00
<i>F. elastica</i> Roxb. . . . .	86.40	12.00	1.60	18.52
<i>F. calophylloides</i> Elmer . . . . .	85.70	11.92	2.38	16.41

(MARAÑON and CABATO, *The Philippine Journal of Science*, Vol. 47, No. 4, Manila 1932).

### Green Manures.

THE USE OF GREEN MANURES AND COVER CROPS IN COFFEE PLANTATIONS. — Green manure plants must satisfy the following conditions.

- (1) Be quick growing and readily spreading ;
- (2) Have abundant leaves ;
- (3) Not be so strong growing that they harm the young coffee trees ;
- (4) Not have twining or climbing stems ;
- (5) Not be exacting, have a deeply rooting system rich in nodules ;
- (6) Not becoming lignified too early ;
- (7) Not be liable to the same diseases and pests as the coffee.

A plant approaching the ideal must be sought amongst the two types of Leguminosae : — those with erect habit — *Crotalaria*, *Tephrosia*, *Leucaena glauca* — and those with creeping habit — *Indigofera*, *Calopogonium*.

The erect legumes are generally sown in rows between the coffee plants ; they provide an effective protection against direct insolation, wind and erosion.

The creeping sorts are often mixed with *Crotalaria* and *Tephrosia* ; they have the great advantage of keeping the ground in perfect condition and considerably reducing hoeing costs.

The chief species of Leguminosae used as green manures in coffee plantations in the Dutch East Indies are the following : — *Tephrosia candida* D. C., *Tephrosia Vogeli* Hook., *Crotalaria usaramoensis* Bak., *Crotalaria anagyroides* H. B. et K., *Indigofera sumatrana* Gaertn., *Leucaena glauca* Benth., *Indigofera hendecaphylla* Jacq., *Calopogonium muconoides* Desv., *Pueraria javanica* Benth., *Centrosema pubescens* Benth. and *Vigna oligosperma* Bak.

(SLADDEN G. E., *Bulletin Agricole du Congo belge*, Vol. XXII, N° 3, Bruxelles, septembre 1931).

J. L.

### ANIMAL HUSBANDRY

#### Present Methods of Testing Draft Animals and their Defects.

The dominating concept in modern stock farming is the selection of breeding stock according to output or yield. Selection implies the estimation of individual efficiency and has given rise to various methods of testing capacity so that animals may be compared as regards yield.

Of recent years yield tests have been perfected for nearly all farm animals and nearly all types of output. Draft efficiency has naturally not been neglected, though it has not been found possible to extend tests of work as widely as those of dairy yield or egg laying. The reason for this may be sought in the fact that tests of draft capacity have not yet been established on sufficiently uniform lines or sufficiently perfected to give unquestionable results yielding an accurate idea of the work out-

put of the animal expressed in figures allowing of comparison with other animals and an estimation of the value of the animal to the breeder.

In general the methods used to-day are those already described (see this *Bulletin*, 1929, No. 8, pp. 319-322). They have been increased in precision and consequently the rules for the tests are now more definite and detailed. As an example we may cite the Rules for the Yield Tests of the Heavy Draught Horse Breeders' Association of Germany, which are very precise in detail.

Two main types of test are still distinguished : — test of maximum force and test of endurance.

The test of *maximum force* is usually made with COLLINS' dynamometric wagon, which is in more general use than Professor VISSER's apparatus. In America only COLLINS' wagon is used and in Germany, which in Europe is the country making most use of these tests, the American dynamometric wagon is also exclusively used for the maximum force test. Further, the Heavy Draught Horse Breeders mentioned above allow no other method.

The dynamometric wagon works in such a way that the pulling of the horses raises heavy weights which act as brakes on the wheels. The resistance of the wagon to motion is regulated by the weights for the wagon cannot be moved until the weights have been sufficiently raised and can go forward only if they are suspended. As the force of the horses diminishes the weights fall on to the floor of the wagon and at the same moment a hydraulic brake worked by an oil pump comes into action. The course is fixed at 8.4 metres. If the horse or team has completed the course the weights are increased and in this way the maximum force of the horses is determined.

The horses are classified according to weight. The Rules referred to above fix the following grades :—

Grade 1. — Horses of less than 600 kg (a pair weighing less than 1200 kg).

Grade 2. — Horses of 600 to 700 kg (a pair weighing from 1200 to 1400 kg).

Grade 3. — Horses of over 700 kg (a pair weighing over 1400 kg).

The initial weight regulating the resistance of the wagon in the tests is varied according to the grade of the horses. For grade 1 it is 1178 lbs (American), for grade 2, 1360 lbs and for grade 3 1451 lbs. A judging committee of 3 persons and the veterinary officers present decide on the weight to be added after each stage of the test. The veterinary officers must also examine the pulse and respiration before and after the tests, and they and the judges make a statement regarding the condition of the horse before and after the test, which is entered in the report. It should be added however that the rules on this point which should determine the fatigue of the animal during the test are very vague and leave too much scope for the subjective element.

According to the German rules the draft force is expressed :—

(1) by the weight in lbs whose resistance the team has overcome, taking into account also the distance covered in metres ;

(2) by the number of h. p. given in the time indicated ;

(3) by the gross weight of the load of a wagon drawn 15 to 20 times over a granite paved road, the wagon requiring the same draft force as the dynamometric wagon.

As stated above COLLINS' dynamometric wagon is practically exclusively used for maximum force tests in the United States and Germany. The VISSER apparatus is used only in the Netherlands where it originated, in certain German competitions and in the yield tests of Libremont in Belgium. It has already been described in this Bulletin (*loc. cit.*) so need not be discussed further.



Besides the test of force there is also a *test of endurance* which allows of the animal being kept under observation for a longer time. • The German regulations already quoted fix 3 different sorts of endurance test.

Test *A* requires horses of 4 years and upwards to draw a wagon weighing 4 times their own weight (horses of 3 years a wagon of 3 times their weight) over a course of 12 km at a minimum speed of 12 minutes per km. The shorter the time taken the higher is the animal placed.

For test *B* the minimum weight is fixed at 32.5 quintals for 1 horse and at 65 quintals for a pair. One point is gained per kilometre, i. e., 1 point per 5 quintals of extra load. The time taken, reduced by the points gained by the load, gives the number of points determining the horse's class. The horse or pair with the fewest points has given the best yield. In this test also the course is fixed at 12 km.

For test *C*, as for test *A*, the gross weight fixed for horses of 4 years and upwards is 4 times their weight and for horses of 3 years, 3 times their weight. The 12 km must be covered at a minimum speed of 10 minutes per km, then the same distance must be covered at a trot with unloaded wagon at a minimum speed of 5 ½ minutes per km. For each minute gained at the trot the time taken to cover the course walking is reduced by one point (minute), though it cannot be reduced by more than 16 points. The time taken to cover the course walking reduced by the points gained at the trot gives the number of points determining the class. The lowest number of points indicates the best yield.

Wagons as far as possible of the same type must be used for the tests. If this is not possible however simple carts loaded with bricks must be used. The cart must have the ordinary grease box, no patent axle or oil bath. Respiration and pulse are tested before and after the trials as in the tests for maximum force.

The programmes for other endurance tests are fundamentally similar to the preceding. Thus, for example, the programme of the endurance tests fixed by the German Light Horse (' Warmblut ') Breeders' Association is the following :—

(1) A weight corresponding to 6-8 times that of the horse or team must be drawn at walking pace over 500 metres of road ;

(2) A weight corresponding to 5-6 times that of the horse or team must be drawn at walking pace over a course of 12 km ; sometimes the return journey is required at the trot with unloaded cart ;

(3) A load corresponding to 3 ½ — 5 times that of the horse or team must be drawn at walking pace over 30 km of road with moderate inclines. The judges may require the return journey to be made with unloaded wagon.

In all these cases the horses are classed according to the time taken to cover the course and the impression of fatigue they give at the end of the test. Classification is made by points of value.

In the yield tests which were carried out at Cremona in Italy on 3 and 4 October 1931 there were 2 different trials. In the one the horses were required to draw a gross weight of 65 to 70 quintals at walking pace over a distance of 6 km ; in the other they had to draw a gross weight of 15 quintals over 12 km of which half had to be at walking pace and half at a trot. Classification was according to the time taken and the degree of fatigue. The latter was determined by examining the horses before and after the test, and half an hour after arrival at the end of the course, as regards temperature, pulse and respiration.

The methods described will suffice to give an idea of present day testing of draft animals. The matter is of importance because it is highly desirable that the selection of draft horses according to yield should be supported on a firm basis. In the research on this subject that the writer carried out at the Zootechnical and Biolo-

gical Institute of the ' Technische Hochschule ' of Munich with a grant from the German Association of Science (' Nötgemeinschaft der deutschen Wissenschaft ') the first question which suggested itself was : what are the desiderata to be supplied by a perfect method ? The divergence between the present methods and this ideal gives a means of judging how present methods satisfy the requirements and how far they give an accurate measure of the real power of the animal.

The essential points may be stated as follows :—

- (1) The test must be theoretically sound as regards yield of work ;
- (2) It must give the results in figures which are independent of the place and season of the test ;
- (3) It must give comparable values which can serve as a basis for selection of breeding stock.

These requirements seem obvious but they are not satisfied in practice.

The draft horse does mechanical work like a machine or inanimate engine. It would thus appear logical to regard the animal doing the work as an animate engine and to measure its capacity for work by the amount of work done as is the practice in testing inanimate engines. But, in addition to the obvious differences, there are between animate and inanimate engines essential mechanical differences. Thus, for example, in the inanimate engine there are definite relationships between the maximum load and other loads. Probably there exist similar laws in animate engines, but these are at present unknown ; our knowledge in fact of the dynamics of animate engines is still very incomplete. This makes it extremely difficult to attain accuracy in tests of yield. To-day a given force is measured without any knowledge of the relationship between the force measured and the capacity of the animal for work. It is recognised that the animate engine is able to exceed its normal power in a measure greatly superior to that of inanimate engines. It is evident therefore that in tests of yield one is often measuring quantities of work which are below or above the real power of the horse. The output of power is very largely regulated according to the amount of work required of the animal and it is only too easy to measure effort which is overworking the horse and will exhaust it prematurely. It is clear that these results are of doubtful value in selection. What is then the right limit?

The dynamics of animate engines will give the answer. One of the characteristics of animate engines is not to be able to work in a continuous manner. After a certain time of work they show signs of fatigue, their power falls off and finally the animal must stop : a pause is necessary to regenerate power. After a suitable pause the animal can again give the same amount of work as before, always supposing that the work required of it before the rest has not exceeded certain limits. These simple considerations demonstrate that in the animate engine there is close relationship between the quantity of work, the time of work and the time of rest.

In general when one speaks of the power of a given animal the maximum amount of work is meant that the animal is able to supply in the course of a normal working day and to continue to supply in the following days and for a long period, possibly of some years. It is clear that this is the quantity of work that must be determined and that it cannot be successfully tested if excessive work exhausting the animal immediately is required of it. Thus the writer is of opinion that *the animal's real capacity for work can be determined only by considering in correlation the quantity of work done, the degree of fatigue and the time necessary to regenerate complete power.*

If it is required that the power of the animal be tested by a method that is theoretically sound, this implies that the test must be based on the principles of dynamics governing the work of the animate engine and must include the whole of the

real power. A perfect test cannot be founded on an empirical basis, demanding *a priori* a unilateral work from the animal in a determined quantity. A test of this kind determines the power of the animal only if it can yield the average work required.

In the second place it has been required that the test shall give results that are independent of the place and season of the test. The environmental factors which may affect the results of the test must be considered.

There is no doubt that the results of a yield test of any kind, whether of milking capacity, egg laying, etc., are influenced to a large extent by the climatic factors, geographical and economic conditions, etc., of the place where the test is carried out. These factors modify the results of all yield tests without exception and to eliminate them from the results would necessitate an exact knowledge of the influence of the environment on the animal. We are still a long way from such knowledge. This is one of the main obstacles in the way of comparing results obtained in different countries.

In all probability these difficulties will remain some time yet, but other local influences affect results unnecessarily in modern methods of testing draft capacity and complicate them to such an extent that even the results of tests taken at different times at places at no great distance apart are not comparable. Let us consider first the influence of the varying friction of different roads. The present regulations on this point lack definition. For example, the definition 'route gazonnée en bon état' leaves too much margin for subjective interpretation. It must be borne in mind that at different seasons with different degrees of moisture the same road will have very different coefficients of friction, thus affecting the resistance of the cart and the paces of the horse.

The determination of the influence of friction on the resistance of the cart to traction presents no great difficulty. Suitable dynamometres would suffice to give results very much more valuable.

It is more difficult to determine the influence of the temperature on the draft capacity. A scientific basis for such study is not yet available. It would first be necessary to have a perfect method for determining the yield in work at the same temperature, then by statistical methods the various powers of the same animate engine under different conditions of temperature could be studied. Unhappily such a perfection in technique has not yet been reached. The influence of temperature however on a thermochemical engine such as the horse is so evident that it is desirable that the temperature should always be noted in reports of trials.

The same is true of other factors such as atmospheric pressure and air moisture. These factors certainly exercise a certain influence on the power of the animal, but on the other hand it is essential to avoid too great complication in the tests. Hence it is not desirable to take into account all the ecological factors but only those causing variations which may exceed the limit of permissible error.

As stated at the outset, tests of draft capacity must primarily furnish data for selection of breeding stock. To obtain this result the 3rd condition established above must be satisfied, that is to say, the result must be expressed in a manner allowing of comparison with other tests made at other seasons and in other places. The form in which the results are at present expressed leaves much to be desired, specially as regards tests of endurance. Classification is effected by means of points, a method which not only gives no exact idea of the absolute amount of work done but also leaves too great scope for the subjective element. It supplies only relative facts. It indicates, for example, that in such and such a test horse A proved better than horse B, but it gives no information regarding the quantity of work done by either.

It may even happen that a horse which is placed first actually did less work than the horse placed fifth, as occurred in the yield test at Cologne on 24 April 1929 (example cited by Dr. OTTEN in *Deutsche Landwirtschaftliche Tierzucht*, Hannover 1929, Heft 28). This drawback results from the fact that the various bases of the different point methods do not fulfil the requirements of the theory of mechanical work. It is also difficult to understand why the good or bad upkeep of the cart, shafts, etc., must be calculated and why it must influence the class of the horse in a test of draft capacity. Even granting that taking these points into account has an educative influence on the owners, the data obtained in this way cannot act as reliable bases for selection or allow of comparison between the capacities of parent and progeny.

Why is it therefore that the mechanical work of animate engines cannot be expressed and calculated in the same units as that of inanimate engines, obeying only the physical laws governing mechanical work? It should even be required that the degree of fatigue and the capacity for recovery be expressed in units of physical measurement, so that the classification of the tested animals may be founded on uniform scientific bases.

The present methods of testing draft capacity are still far from the ideal explained briefly above. But in spite of their imperfections they play an important rôle if only because they popularise the concept of appraising draft animals according to yield. It is to be hoped that in the near future the methods will be perfected so that they may form the basis of scientific breeding.

E. MOSKOVITS.

## Miscellanea.

### General Stock Farming.

GENERAL ASSEMBLY OF THE FRENCH ANIMAL HUSBANDRY OFFICE. — The General Assembly of the French Animal Husbandry Office, which met on 5 March in Paris, was mainly devoted to discussion of the more important of the present problems of stock farming in France and particularly to that of importation quotas. The following resolutions were formulated and presented to the Minister of Agriculture:—

"A. The members of the French Animal Husbandry Office,

Being of opinion that, though the quota for imports of animals for slaughter and meat may have prevented a catastrophic fall in livestock prices on our markets, the measure has provoked reprisals abroad which are highly prejudicial to international trade and annul all our efforts to extend our foreign market, recommend:—

That the public authorities should with the utmost urgency study means of re-establishing foreign trade relations.

In particular it is requested that a compensatory exchange be established between the countries exporting animals for slaughter and meat and the stock raising regions in France, fixing by means of treaties or agreements an *ad valorem* percentage on the price of breeding stock purchased by the said importing countries in accordance with the tonnage imported".

"B. The members of the French Animal Husbandry Office,

Being of opinion that the measures for regulating importation of horses for slaughter are inadequate to ensure the protection of French stock breeding, recommend:—

(1) That animals intended for slaughter should be branded on the shoulder with the letters 'B. C.' so as to make possible a satisfactory control of the destination of the animals.

(2) That compensation in correspondence with the quota be granted by importing countries in favour of the purchase of breeding stock belonging to French breeds".

INAUGURATION OF THE PIEDMONT INSTITUTE FOR SCIENTIFIC STOCK FARMING AND DAIRYING. — The new quarters of the '*Istituto zootecnico e caseario per il Piemonte*' at Lucento in the province of Turin have been opened in the presence of the Prince of Piedmont and the Minister of Agriculture. The Institute is now provided with pre-

misses worthy of the excellent work that it has accomplished in spite of limited resources and inadequate equipment. In his inauguration speech M. DE ALBERTIS, the President of the Institute, spoke of the valuable work done by the Director, Professor VEZZANI.

S. T.

REGULATION OF HERDBOOKS FOR FARM ANIMALS IN FRANCE. — A Presidential Decree of 16 February 1932 institutes at the Ministry of Agriculture a register of approved herdbooks, studbooks, etc., a register in temporary inscription of herdbooks, studbooks, etc. and a register of special herdbooks, etc.

Ministerial Decrees of 29 February and 15 March 1932 fix the technical and administrative conditions for entry in these registers.

### Horses.

ENCOURAGEMENT OF HORSE BREEDING IN SWITZERLAND. — The following information regarding the new measures for promoting horse breeding in Switzerland in accordance with the Decree of 7 July 1931, are taken from a report by M. A. KÖNIG, Vice-Director of Agriculture for the Federal Department of Public Economy, published in the *Annuaire agricole de la Suisse* 1931.

One of the important changes involved in the new measures is the abolishment of the designation 'saddle horse' from the aims of the stud breeder. In accordance with the Decree the Confederation will subsidise the breeding of draught horses which will fulfil the requirements of the farm as well as of the army. It is fully understood that the breeding of the improved halfbred type is included and will continue to receive Government support.

The Federal Depot for Stallions and Colts at Avenches will continue being used as in the past. As regards the increase in the service tax to safeguard the interests of the private stallion owner a new provision has been inserted by which Cantons requiring the stay of stallions from the Depot must guarantee at least 30 mares to be served or the corresponding value of service taxes calculated at a minimum rate of 20 francs per mare. In order to facilitate the purchase of stallions by the Syndicates and their members the Depot is authorised to sell them stallions on payment of the valuation price.

Until now the Confederation has allowed no special grant for the rearing of entire colts, which will in future be aided and encouraged by the granting of prizes amounting to 100 fr. for colts from 1 to 2 years old and to 250 fr. for those over 2 years. In regard to grants in favour of private stallion owning the new regulations differ considerably from the earlier ones. Hitherto the Confederation has allowed a grant of 50 % of the value from the date of approval, then after 6 years of service with satisfactory results a supplementary annual grant of 5 % of the estimated value. This method of subsidising has taken into account that most of the stallions were imported from abroad. Now that the stallions are for the most part bred in the country the grant immediately payable amounts to only 25 % of the value. On the other hand allocation of supplementary grants begins from the first year of service provided that the stallion has served at least 15 mares during the season. The annual increase in these grants rises to 5 % of the value and may be increased to as much as 10 % from the 3rd year. In addition the owner will receive a further supplement for each filly sired by his stallion which is presented for the first time at the Annual Show and awarded at least 70 points.

According to the new regulations Syndicates which have less than 10 prize brood mares lose their rights to the grants for mares and fillies as long as the number remains below 10.

The measure is of interest which rules that an animal entered for the show may not receive an award unless it is of the required type of horse, of the breed selected by the Syndicate and not only sired by an approved stallion but is progeny of a mare which has been awarded a prize in a Federal or Cantonal Show.

The Decree contains also provisions relating to the allocation of grants for the formation and upkeep of studbooks.

HORSE BREEDING PROBLEMS IN ITALY. — The present situation and problems of horse breeding in Italy were discussed in the Chamber of Deputies by Mr. GAETANI.

At the present time the stud farming in Italy is insufficient to meet the needs of the country, largely because the animals are not produced as cheaply as in the main export-

ing countries such as Poland, Hungary and Yugoslavia, even taking into account the present custom duties.

As regards technical breeding problems the disputes between the partisans of the English thoroughbred and the eastern horse have been settled some time ago by the Government having allotted to each district a certain breed. Thus in Sardinia a light saddle horse with a basis of Arab blood is bred. In Sicily a saddle horse is bred from Arabs and English thoroughbreds which can also be used for draught purposes and is suitable for the army. In the Salerno district, after a period of uncertainty, a horse suitable for officers' use and a heavy cavalry horse are being bred. In Apulia, Basilicata and the Abruzzi mules are bred. In 'Venezia Tridentina' the Aveline breed must be maintained, and for 'Venezia Giulia' the Lipizza breed has been chosen. The Persano breed has been revived on a basis of Arab blood. In the Po Valley horses particularly suitable for artillery use are raised.

The Government has at its disposal 8 depots and 86 stations for stallions. There are special courses in horse-breeding for trained agriculturists.

The studs will receive during the year 1932-33, 15 million liras, of which 3 million will come from service taxes and 12 million from Government grants. Out of this sum 2 million will be set aside for raising donkeys and mules.

For further encouraging the industry it is proposed (1) to increase the duty on imported horses, (2) to increase the State contribution by at least 2 million liras, (3) that horse racing should be under the supervision of the Ministry of Agriculture, (4) that the official horse-raising programme should in future be rigidly adhered to.

### Cattle.

NEW METHOD FOR TESTING DAIRY COW FEEDING. — According to a communication from M. A. LEROY to the French Agricultural Academy (25 November 1931) the results of the dairy cow tests at the 'Better Cows Competition' and of the tests of the Seine-et-Oise and Seine-et-Marne Dairy Control Syndicates have shown a perfect agreement between the figures calculated according to C. W. TUMER and W. L. GAINES' law and the yields observed in the well-fed herds tested.

The law referred to states that the reduction in milk production after calving is a function of the time if the cow is normally fed during the whole lactation period and is not served before the 6th month of lactation. If  $M$  is the yield during the month of maximum production (normally the 2nd month after calving) and if  $L_3, L_4, L_5 \dots$  etc. represent the yields of the 3rd, 4th, 5th ... etc. month it results that

$$\frac{L_3}{M} = \frac{L_4}{L_3} = \frac{L_5}{L_4} = \dots = \frac{L_8}{L_7} = CP$$

The value of the coefficient  $CP$  is usually between 0.85 and 1.0. According to GAINES it is 0.95 for cows giving a maximum of 18 kg. of milk and falls to 0.85 for cows giving a maximum of 36 kg.

By means of this law the farmer can readily calculate the theoretical yield of each cow which allows him to compare the theoretical mean of the herd with the mean obtained in practice. This comparison shows the farmer if the feeding is inadequate or badly balanced for if all the cows of a herd give yields regularly below the corresponding theoretical figures there is likelihood that this abnormal state of things results from a defective system of feeding.

### Pigs.

PIG TYPES PREFERRED IN GERMANY. — An enquiry made by the *Fleischerverbandszeitung* with regard to the types of pig most in demand in Germany showed that there is most demand for pork pigs of from 90 to 105 kg live weight. There is also a demand for fat pigs with a live weight of 135 to 150 kg for the curing industry. The demand for the latter type of pig is much less than for the former and is required mainly in autumn and winter. The *Blätter für Landwirtschaftliche Marktforschung* (Berlin, Vol. 2, No. 7), from which this information is taken, adds that the facts are supported by observations on fluctuation of prices. In autumn and winter fat pigs are dearer than pork pigs, whereas in spring and summer the light type is relatively, and sometimes even absolutely, priced higher than the other type. This is of interest seeing that the produc-

tion of 1 kg. of live weight is more costly for the heavy types than for the light. It appears from recent research carried out by M. NIESCHLANG that, in fattening up to 100 kg of live weight, 3.6 kg of grain are required to produce 1 kg of live weight, but in fattening further to 125 kg 6.4 kg. of grain are required for each kilo of gain.

CHANGES IN THE UTILISATION OF PIGS IN POLAND. — The Polish export trade in pig products has shown a tendency of recent years to develop in such a way that pork and products of the curing industry have gained in importance over live pigs. This is clearly apparent in the following table which shows the exports during the last three years.

	1929	1930	1931
Live pigs (number) . . . . .	980 000	721 000	374 000
Pork (quintals) . . . . .	99 000	77 000	121 000
Bacon (quintals) . . . . .	120 000	274 000	529 000
Products of the curing industry (quintals) . . . . .	17 000	34 000	80 000

The total value of the exports has however diminished : in 1929 it was 226 million *zlotys*, in 1930, 238 million, in 1931, 197 million.

With a view to promoting the exportation of bacon a new regulation has been legalised as from 1 April 1932, which standardises bacon production. (*Nachrichten über den Vieh- und Fleischverkehr*. Berlin 1932, Nr. 16).

### Poultry.

PREPARATIONS FOR THE WORLD POULTRY CONGRESS. — The preliminary preparations for this Congress, which will be held at Rome in September 1933 under the patronage of the King of Italy, are already well advanced.

The Secretariat and Committee of Patronage are arranged ; the President will be the Italian Minister of Agriculture and Forests, the Vice-President will be M. KOCK, Councilor of State for Denmark and President of the International Association for Scientific Poultry Keeping. During the Congress an International Poultry Show will be organised in the Market of Trajan, Rome.

S. T.

### Sericulture.

A SERICULTURAL CONGRESS IN BULGARIA. — On the initiative of the Chamber of Commerce and Industry of Sofia a Conference met at Vratza on 29 November 1931 to discuss silkworm breeding, silk throwing, spinning and weaving. After animated discussions the Conference was agreed that in spite of the present crisis in the silk industry in Bulgaria sericulture is of importance for the country and should be actively supported.

E. M.

## AGRICULTURAL INDUSTRIES

### Manufacture of Processed Cheese.

By processed cheese, pasteurised cheese, kraft cheese, etc. (in French 'fromage pasteurisé', 'fromage fondu', 'fromage rénové', 'fromage en boîtes'; in German 'Schmelzkäse', 'Käse ohne Rinde', 'Konservenkäse', 'Schachtelkäse') are meant the cheeses prepared by softening cheeses of varying degrees of maturity by means of certain salts and moulding them into convenient form for purposes of storage or to utilise cheeses which have become slightly defective in texture or shape.

HISTORY AND DEVELOPMENT OF THE PROCESSING OF CHEESE. — The first practicable process for preparing this type of cheese was discovered by Messrs

GERBER and Co. of Thun in Switzerland. As early as 1905 this firm was seeking a means of storing Emmenthal cheeses by making them into more practical form, particularly with a view to exportation to the tropics. As a result of long and costly experiments a process was found of making a good quality Emmenthal cheese that could be kept for a long time. At first the cheese was packed only in tins for hot countries, then it was realised that this type of cheese packed in wood, and later in cardboard, could find as wide a market, if not wider, in temperate regions. Now it is in countries with temperate climates that processed cheese has acquired economic importance.

The manufacture of processed cheese has developed elsewhere besides Switzerland. According to Swiss statistics the country exported in 1929 52,518 quintals (net weight) of boxed cheese. In Germany the trade in processed cheese was nearly half (40 %) of the total commerce in cheese; there are about 60 factories. In France most of the factories are in the Jura mountains where most of the Gruyère cheese is produced, which is the main foundation of French processed cheese. There are several factories also in England, where Cheddar cheese is preferred as the basis. Holland produces mainly 'Gouda' in blocks. In Norway 'Primula' cheese is made from 'Kawli' in the mountains. Denmark although a dairy farming country is as yet little interested in processing cheese. Austria has 7 large factories, Hungary 5. There are also several in Italy, Czechoslovakia and Rumania. In the United States about a quarter of the cheese production is melted and pasteurised, using 'Cheddar', 'Limbourg', 'Camembert' and 'Brique'. Canada, Australia and New Zealand also make processed cheese, mainly using Cheddar.

MANUFACTURING PROCESSES. — There are 3 main operations: — (1) Preparation of the materials — (2) Softening or pasteurisation — (3) Moulding and packing.

(1) *Preparation of the materials.* — First the cheeses to be used must be selected, each being examined as regards flavour and aroma and then graded. Then the proportions to be mixed must be determined. This is done by testing samples on a small scale, which is a long and tedious operation but brings its compensation in the quality of the final product. Different sorts of cheese can be used or, as is most usually the case, a single sort. When one cheese is used such as Emmenthal, Gruyère, Cheddar, Tilsitt, Trappist, Romadour, Camembert, etc., it is usual to mix newly-made and matured cheeses. This is not only for the flavour but to facilitate the softening of the cheese, owing to the different chemical properties of new and matured and over-matured cheese.

Use of newly-made cheese always has drawbacks; it is almost impossible to prevent the fat 'oiling off' and the resulting cheese is apt to be rubbery. The best results are given by cheeses that have matured from 4 to 7 months. New and matured cheeses can however be mixed, e.g., 2 to 3 parts of 2 months-old cheese with 1 part of well-matured cheese.

Next the rind must be removed or cleaned, the cheeses cut up, ground and well-mixed. To grate the rind it is first softened in steam or with boiling water and, in the case of waxed cheeses, rubbed with a metal brush. The cutting up is usually started with a steel wire and continued with a two-handled knife which allows of rapid work. It is essential that the blades shall be of rustless steel. Any defective or non-uniform portions of cheese are removed and form an excellent feed for pigs or poultry. When the cheese is chopped it is well-mixed and then ground in the 'Wolf' crusher (fig. 1); when it emerges it is already soft and can be heated



as it is, though it is more usual to pass it first through a mill (fig. 2) with 3 cylinders of porphyry or granite, to produce a finer texture and more perfect aeration of the mass.

*Emulsifiers and other ingredients.* — The materials added are emulsifiers to make the mass of cheese rise and emulsify the fat, antiseptics when allowed and necessary, spices, colouring matters, etc. The emulsifiers are neutral or slightly alkaline salts or mixtures of such salts. Sodium citrate is most commonly used, but mixtures of sodium and calcium citrates are also used. Tartrates are not recommended for tartaric acid usually crystallises out giving the final product a sandy texture. The following recipes are recommended by O. GRATZ. *Recipe 1.* — 1 kg. of citric acid (crystallised) + 0.7 kg of anhydrous sodium carbonate + 2.6 kg. of water. For 1 kg of cheese 75 c. cm. or 80 gm of this mixture are required. *Recipe 2.* — 1 kg citric acid (crystallised) + 1 kg of anhydrous sodium carbonate + 1.4 kg of water + 0.16 to 0.24 gm of calcium oxide. For 1 kg of cheese 70 to 80 gm of this mixture are required.

Disodium phosphate may be successfully used as an emulsifier, preferably in powder form, at a rate of 50 to 60 gm for 1 kg of cheese. If additional water is necessary it should be added separately for disodium phosphate is not readily soluble. As regards flavour, cheeses made with phosphate are often preferred to those with citrate.

According to PÁSZTOR's experimental results the composition of the emulsifying solution must be adapted to each individual cheese mixture. The problem of the ideal quantity of emulsifier to use remains, however, unsolved and empirical trials have to be made in small containers.

There is a correlation between the age of the cheese, its pH and the emulsifier shown in the following table.

Age of cheese	pH	Emulsifier	Reaction of emulsifier
10 days . . . . .	5.1 - 5.2	Disodium phosphate . . . . .	Neutral - basic
20 days . . . . .	5.3 - 5.4	Trisodium citrate + disodium phosphate . . . . .	Neutral - slightly acid
30 days . . . . .	5.6 - 5.7	Disodium citrate (or preceding formula) . . . . .	Slightly acid
40 days . . . . .	5.8	Disodium citrate . . . . .	Acid
50 to 60 days . . . . .	5.8	Disodium citrate . . . . .	Acid

*N. B.* — The emulsifiers were used in these experiments at 2 - 2.5 - 3 %. The cheese melted equally well with 2 % solutions as with those at 3 % and even 3.5 %, except that disodium citrate seemed more favourable.

*Other ingredients.* — Spices should be mentioned in the first place. In Europe cumin and melilot are chiefly used ; formerly cloves were used. In America spices are used on a wider scale : cloves, nutmeg, olives, etc. Recently wine, garlic, shallots, tomatoes and mustard have been used in Switzerland.

Sometimes also cream, butter, dried milk, concentrated whey or condensed milk are added, the last in particular improving the flavour. Sometimes glycerophosphate of calcium is added and more frequently vitamins, specially the preparation 'Eviumis'. Legislation already regulates in part the use of the various substances, also of colouring materials. In Switzerland, for example, the use of colouring matter is allowed provided that only vegetable dyes are used.

(2) *Melting and pasteurisation.* — Amongst other factors affecting the quality of the final product are the duration and temperature of the heating process, the moisture content and hydrogen ion concentration of the cheese mass.

A number of scientists have attempted to determine the most suitable *temperature* for fusion and pasteurisation. For fusion only a temperature of 60° to 70° C for a few minutes suffices, but pasteurisation, requires a longer time, viz, half an hour at 63°, 20 minutes at 65°, and so on.

According to O. MEZGER and J. UMBRECHT the duration of the melting and pasteurisation process varies from 4 to 25 minutes increasing the temperature progressively up to 60°, 70° C and even higher. These figures however refer to American practice without direct steam and vacuum apparatus. In Europe with steam at a pressure of 1.5 to 2 atmospheres melting takes place *in vacuo* at 40° to 50° C. In general the duration of the process depends principally on the kind of cheese, the steam pressure and the temperature, but it is longer for hard cheese. O. GRATZ recommends a temperature of 65° to 70° C (maximum). He considers it better to prolong the heating rather than to raise the temperature, particularly for the sake of flavour. But on the other hand according to TEMPLETON and SOMMER a temperature below 60° C does not give good results owing to the possibility of fermentations taking place which cause a mouldy flavour.

The experiments of PÁSZTOR show that the consistency of pasteurised cheese depends mainly on its *water content*. As the water content may be regulated at will a cheese of any desired degree of hardness may be obtained. The higher the water content the softer the cheese; 38 to 40 % gives the best cheese. Loss of water during heating may vary from 0 to 5 %. The quantity of water to be added must be carefully calculated since an excess may result in oiling off of the fat whatever the quantity of emulsifier used.

As regards *hydrogen ion concentration*, according to TEMPLETON and SOMMER a pH between 5.8 and 6.3 gives the best cheese. Cheeses with an alkaline reaction must be avoided on account of their soapy flavour and soft texture. Cheese with a neutral reaction, according to the same writers, is liable to decomposition.

The technique of the processes used has been carefully kept secret. In general it may be said that there are two main processes, one based on heating *in vacuo*, the other without vacuum. There is a continuous method which is kept secret, in which the cheese is heated to about 55° *in vacuo*. But this method, which is used in Switzerland with Gruyère, does not pasteurise the cheese. In American factories the cheese is usually heated directly with steam without a vacuum; in most cases the factory works without interruption; the cheese is ground, mixed, heated and melted and flows continuously into the filling and packing machines.

For the melting apparatus (figs. 3 and 4), which may vary in capacity from 2 to 1000 kg and upwards, the best metal is nickel; the pan is however usually of tinned copper with a steam jacket and pressure gauge. There is a 3-bladed agitator with scrapers.

The melting and heating require a certain amount of practice and experience. First the pan or boiler is filled with the mixed cheese, the water and chemicals are weighed out and added, then the boiler is closed, the vacuum tube opened and the agitator set in motion. The boiler must be opened from time to time to watch the progress of melting even if there is an observation hole. With apparatus using direct steam care is necessary that the steam is as dry as possible and that the pressure is kept regular at about 2.5 atmospheres. The visible changes take place in the following order: the cheese melts, fat appears and disappears again as the mass becomes more plastic; the mass which at first has the appearance of a purée becomes gradually homogeneous, thickens and becomes like syrup of honey; this viscous aspect remains only while the cheese is hot.

The melting mass does not always acquire the syrupy consistency due to the

*Machines and appliances used in the manufacture of processed cheese.*

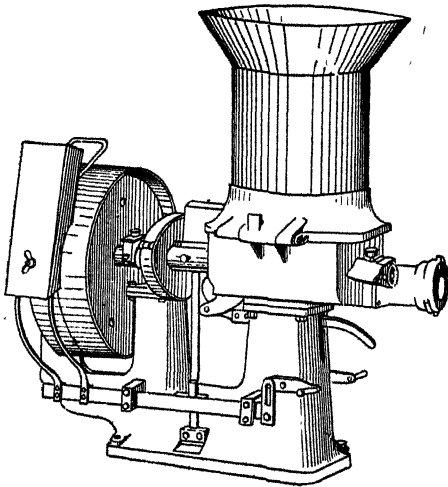


FIG. 1. — 'Wolf' crusher.

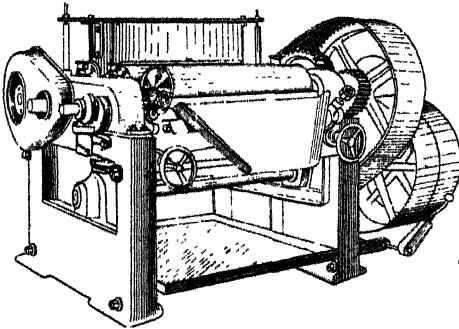


FIG. 2. — 3 - Cylinder mill.

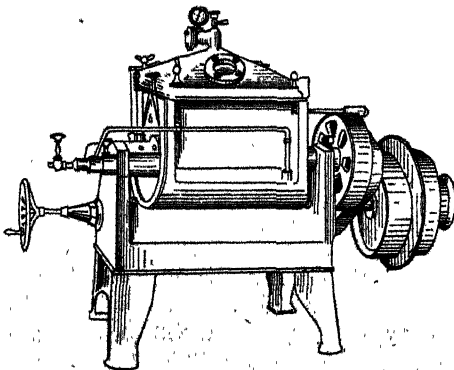


FIG. 3. — Vacuum heating apparatus.

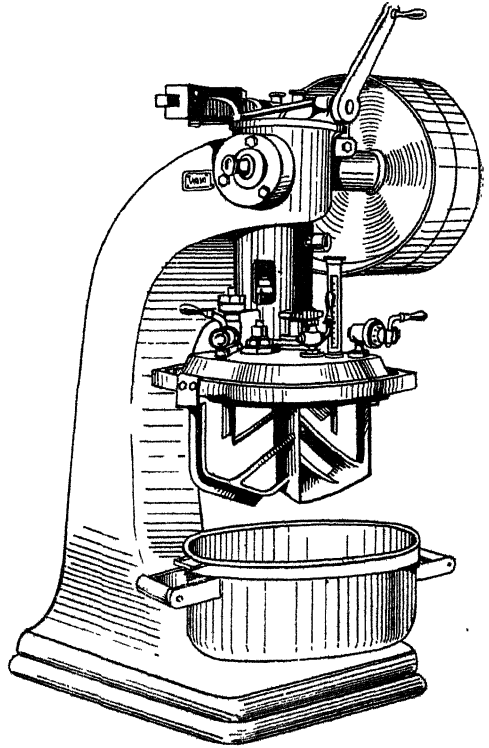


FIG. 4. — Heating machine showing pan and agitator.

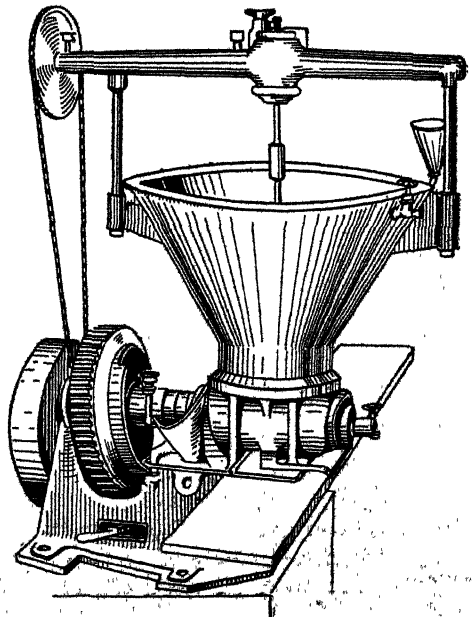


FIG. 5. — Machine for filling the moulds.

emulsification of the fat. Sometimes the mass of cheese becomes granular, when hot, which means that the fat has not been absorbed by the cheese. When cooled the cheese is sandy or mealy to the tongue. Separation of the fat may be caused by the age of the cheeses, the use of insuitable emulsifiers (PÁSZTOR) or by too high a temperature in the pan or filling machine. Separation of the fat may be avoided either by adding a solution of sodium carbonate or bicarbonate during the heating process or by increasing the rate of revolution of the agitators.

The melting process taking place at a temperature of 65° to 75°C destroys large numbers of bacteria, thus ensuring a better keeping quality in the product. It may be that at this temperature part of the vitamins and enzymes become inactive. According to experiments effected by CSIZAR, 99.9 to 100 % of the bacteria, but not the spores, are killed during the heating process ; but in the final product after 40 days the number of bacteria, specially lactic acid forming bacteria, increases rapidly.

The physical and chemical processes taking place are explained by F. KIMFERLE as follows. The raw cheese may be regarded in a wide sense as an emulsion. The constituents of the raw cheese and more particularly the water-soluble substances, such as lactose, nitrogenous and inorganic substances, the colloidal substances and albuminoid substances, retain the fat which cannot separate out from the emulsion. Not only the transformed cheesy mass but also the other substances contribute to the stability of the emulsion which is so important a part of the process. The final product must be a stable emulsion. The emulsifiers act by dispersing the colloidal system of the albuminoids of the raw cheese and emulsifying the fat, then with heat they bring about liquefaction of the cheesy mass. The albuminoid colloids undergo a change of state from a physical and chemical point of view and, the elastic colloids of the emulsion being capable of absorbing water, the whole mass swells. The increase in volume takes place by the molecules of water being introduced between the molecules of the cheesy mass, but without destroying the union of the particles. While the mass solidifies the fat also undergoes changes of state : first, after being heated for a short time, it can be seen to separate from the mass, then it is mechanically divided by the agitator and homogenised when the cheese attains its elastic consistency. The emulsifiers are of primary importance in the emulsification of the fat. Sodium citrate is hydrolysed so that the base acts on the fat causing saponification and thus emulsification.

C. MEZGER and J. UMBRECHT hold that during the process of pasteurisation the cheesy mass swells under the action of heat and that the particles of cheese change position. The emulsifiers are removed from the lime to the paracasein and a superficial decomposition of the proteins sets in ; at the same time the proteins absorb water and swell. There is further a slight saponification of the fat ; part of the globules may according to the conditions combine into small masses ; these may later be emulsified either by the mechanical agitator or by partial saponification ; in the latter case the molecules of soap cause a fall in the surface tension of the fat. In general the fat globules are prevented from combining during the swelling of the protein substances which act as buffer colloids to the fat.

The melting of the cheesy mass consists essentially in a change of state, i. e., a swelling, of the proteins.

(3) *Moulding and packing.* — When melted the cheese remains for 15 to 20 minutes in the funnel at a temperature of 60° to 70°C. The moulds are filled by a machine regulated for a given quantity of cheese. The filling machine (figs. 5 and 6) usually has a double-walled funnel containing 30 to 40 litres of steam-heated water. The machines are regulated to give portions of 13 to 250 gm, or in certain cases 3000

gm, with an accuracy of  $1/25$  to  $1/2$  gm according to the quantity of cheese. The moulds usually give cuneiform pieces for boxes containing 4, 6, 8 or 12 pieces. The hot cheese is poured into moulds of aluminium, tin, wood or celluloid lined with tinfoil. Experiments have shown tinfoil to be the best packing material for processed cheese.

The newly packed cheese is still warm and must be cooled. Block cheeses require special cooling chambers.

*Storage of the finished cheese.* — Processed cheese is liable to a considerable loss of water if not stored in suitable conditions. For successful storage the cheese should be sterilised and pasteurised to prevent the bacterial content, already reduced by 99.5 to 100 % during the melting process, from increasing again rapidly. Steri-

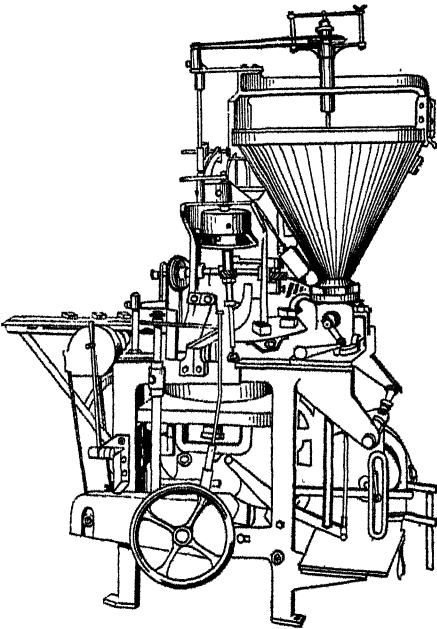


FIG. 6. — Automatic machine for filling the moulds, packing and labelling the processed cheese.

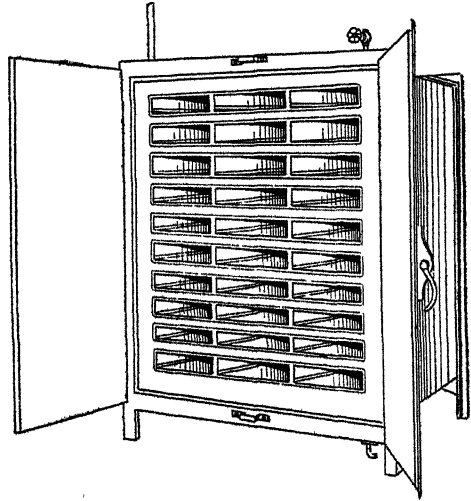


FIG. 7. — Special stove for sterilising (pasteurising) the packed cheese.

lisation is of special importance with Reamadour and Limbourg cheeses which are particularly liable to bacterial activity causing swelling.

For sterilisation there are special stoves (fig. 7) in which the packed boxes or the wrapped cheeses are placed. The latter method is preferred in case cheese overflows from the wrapping during sterilisation. The temperature should not exceed  $65^{\circ}$  to  $68^{\circ}$ ; 30 to 45 minutes is sufficient.

Common defects in processed cheese are of colour, fermentation, swelling, flavour and consistency. Moulds and maggots sometimes also occur.

Amongst colour defects that may occur are spots due to incompletely ground rind. A brownish orange colour is caused by cheese having remained stuck to the sides of the pan, which is specially liable to occur with Cheddar. A salmon pink

colour results from too high a temperature. A white cheese comes from excessive calcium hydrate. The commonest defect is a blackish coloration of the cheese and tinfoil which may be caused by various factors, some writers thinking it due to the composition of the cheese and others to that of the tinfoil. To prevent it care must be taken not to use an excess of chemicals nor porous tinfoil, to avoid storage at too high a temperature, to put the cheese in a cool place immediately after preparation and to cover the tinfoil with a thin layer of celluloid or gum lac so as to close any pores in the foil and prevent access of air.

Swelling and fermentation of the prepared cheese occur often during the warm season and when the cheese has been stored in too warm a place. In general the cause of swelling may be sought in the bacterial content of the raw cheese. O. GRATZ considers it is mainly due to the anaerobic butyric acid bacteria. To avoid introducing these bacteria a careful selection of the raw cheese is necessary.

Amongst defects in flavour is the metallic taste produced particularly if the boiler and filling machine are of tinned copper and if the cheese has been in contact with the copper. Bitterness is met with in soft cheese and in cheeses containing excess of phosphates. The cheeses are salted to disguise this defect. A sour taste is caused by free citric or other acid used in excess in the preparation of the emulsifier. A caustic flavour is caused by excess of calcium salts. A chemical flavour comes from wrong use of the chemical ingredients. A cooked flavour results from the cheese having remained too long in the boiler or having been melted at too high a temperature.

The consistency of processed cheese is required to be as firm as that of the raw cheeses used. It is sometimes difficult to obtain the desired consistency with hard cheeses. PÁSZTOR's experiments showed, as mentioned above, that the water content is the main factor affecting the consistency. Too soft a cheese results from introduction of moist steam and is the commonest defect. To harden a soft cheese sufficient hard cheese may be added to bring it to the desired consistency. An excess of hard cheese may also be a disadvantage.

The presence of moulds in the factory often causes heavy loss. The entry of air into the cheese packet is the main cause of the growth of moulds, but chemicals and salt and too high a storage temperature may also favour mould.

\* \* \*

The economic importance of processed cheese in the cheese industry is evident. The makers have realised the importance of an industry which allows of the use of cheeses defective in appearance but otherwise sound. The industry is thus a refining process for second and third grade cheeses which, according to LUNDSTEDT, are as valuable as the first grade. The advantages of the industry can be preserved however only by a perfect technique and scrupulous attention to detail in the factories.

E. GASSER.

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## BOOK NOTICES \*

### Oil Yielding Plants.

EBERHARDT Ph., *Le Ricin : Botanique, Culture, Industrie et Commerce*, 3<sup>ème</sup> édition, 1 vol., 136 p., 30 fig. Société d'Éditions Géographiques, Maritimes et Coloniales, 184, Boulevard Saint-Germain, Paris, 1931.

[A new edition of this work has been necessitated by the impetus given to the growing of the castor oil plant owing to the new uses of the oil as a lubricant for engines and more particularly for aircraft engines.

The book begins with an account of the distribution of the plant and then gives a careful botanical description of the varieties and strains. The cultivation is then discussed with special reference to the methods used in India (Bengal, Dacca, Punjab, Bombay, North-West Provinces and Madras) and the French Colonies (Syria, Tunisia, Algeria, Morocco, Senegal, Madagascar, Indochina, French Guiana, French Antilles and New Caledonia).

Part II is devoted to the industrial treatment: composition of the bean, processes of oil extraction, castor oil from an analytical standpoint, adulteration, defecation, oilcakes, and medicinal and industrial uses of the oil.

Part III deals with the commerce of the oil and oilcakes, commercial sorts of oil and oilcakes and general information relating to the trade in the bean and oil.

The work is completed by a very full bibliographical index].

J. L.

### Starch Yielding Plants.

REGNAUDIN A., *Le Manioc : Culture, Industrie*. 1 vol., 105 p., 12 fig. Société d'Éditions Géographiques, Maritimes et Coloniales, 184, Boulevard Saint-Germain, Paris' 1932.

[This work will be of great interest and value to all concerned in the industries connected with manioc or cassava.

A brief but careful account is given of the habitat and culture of the plant before the study of its industrial treatment, which is the main part of the book. It is apparent that the writer speaks from first-hand knowledge and he deals in turn with Colonial starch manufacture from the fresh cassava, special starch manufacture from dried

(\*) Under this heading are included short synopses of books received for review.

cassava, with in each case a diagram of the factory plant, then the preparation of dextrine and glucose from cassava. Finally there is a discussion of activated vegetable carbons and methods of determining the starch in cassava, the glucose syrups and dextrines, and experimental confectionery.

J. L.

### Viticulture.

*Schriften des Instituts für Sozialforschung in den Alpenländern an der Universität Innsbruck*, herausgegeben von Prof. Dr. K. KAMP, 6. Folge: F. ULMER, *Die weinwirtschaft des Etschlands*, 101 p., Kartenbeilage. Universitäts-Verlag Wagner, Innsbruck, 1931.

[The scope of this work is vine growing in the part of the southern Tyrol called the Alto Adige by the Italians, and it is treated from technical and commercial standpoints. The pre-war conditions are compared with present conditions particularly as regards scientific management, phylloxera control and cooperative activity.]

After the Italian annexation, which brought the competition of Italian wines, the Tyrolese viticulture has so far succeeded, in spite of numerous difficulties further accentuated by the general economic crisis, in holding its own, largely as a result of the excellent quality and special character of its products. The conditions of the region, cut off as it is by customs barriers from its natural markets, are however becoming extremely difficult. Market conditions are now very uncertain owing to their depending on fluctuations in the monetary exchange, customs duties, taxes, commercial treaties, home and foreign political measures, etc.; 50 % of the production, as compared with 20 % before the war, is exported. The export trade into Switzerland and Germany has developed considerably, whereas Austria, which was the main consumer in pre-war days, now buys no more than half the old amount.

To remedy this state of things the writer recommends a concentration of the trade making use of an intensified and uniform publicity. Further, to counterbalance the effects of the anti-alcoholic movement, he suggests the production of table grapes and the manufacture of grape-juice, which would make it possible to continue the famous grape cures of Merano].

N. v. G.

### FORESTRY

#### The Regeneration of Forests damaged by Fire.

Forest fires are a cause of ever increasing risk for the preservation of the forest resources of the majority of countries. Naturally the danger for countries which have a dry climate is the greater, but it has been observed that in regions where a damp climate and a relative absence of wind affords a certain degree of protection, this safeguard may prove inadequate to check a certain lack of balance between the true possibilities of the wooded area and the actual results of the methods of exploitation adopted.

Although statistics of forest fires for the various countries are generally far from complete, they show clearly enough that the increase of fires in certain districts always bears a certain relation to faulty methods in the utilisation of the forests. After a fire temporary cropping and excessive pasturing on the burnt surface tend increasingly to reduce the vitality of the stands, thus diminishing their power of resistance to fire. As a result fires recur in the same localities, the result being very serious hindrance to all forms of regeneration work.

Forestry specialists and scientists are agreed that fires always have prejudicial effects on any plan of regeneration of burnt over forests with high class trees. In this connection sooner or later the results of the fire will be shown but they are in any case bound to appear. For whole regions the preservation of *climatic forests* which have become established after a long period of years becomes jeopardized.



It is recognised by the experts that fire by itself is a serious cause of deterioration in the local climatic flora ; on the other hand the trouble caused in this way alone to the forest milieu may be set off by the operation of natural reconstituent forces where other influences, generally due to human action, do not intervene to increase the difficulties of the situation. Apart from such influences the regeneration of burnt over forests with valuable species would simply be a slow process. On the other hand, if the troubles are allowed to continue, far-reaching changes in the ecological sense will begin to operate more quickly than natural recovery. Such changes would be manifested externally in the establishment in districts specially liable to fires, of a substituted flora which might be of a very enduring order. As a rule however such flora would not be particularly fire resistant, a fact which would tend to postpone the return of the more valuable species. The idea of " fire zones " or " fire districts ", which is frequently met in the literature on forest fires may well have its origin in sources of this order.

ROGER DUCAMP (France), in his investigation of the district of the Esterel and the " Mountains of the Moors " (*les Maures*) which have for a long time past been subject to extensive forest fires, was struck by the external aspect of the stands still remaining in the area. He endeavoured to trace specific existing characteristics from which he might be able to reconstruct the features of the original forests. He however found only a kind of anarchic disorder and the plant growth was no longer in any sense analogous or similar to the original *sylva*.

Is it therefore necessary to conclude that every kind of forest fire necessarily involves these grave consequences. To this question no general answer can be given for forest fires fall into a number of classes (including surface fires, ground fires, fires in the tree tops and general fires on a large scale) and the results are related to the parts of the stand affected. In general however it may be stated that fires which are not due to natural causes in virgin or well preserved forests of long standing must be considered as factors which always bring about a weakening in the predominance of the forest in a district. It is well known that fires due to lightning or spontaneous combustion have occurred in the course of centuries during the life of primeval forests, but such fires have never been able to check regeneration with the better types. Scientists have attempted to determine the influence of fires on regeneration in virgin forests. Thus according to MÜLLER (Germany) the homogeneity in composition as also the similarity of age shown in the primeval forests in Bulgaria, which have been the object of his special study, are due to fires which have occurred in the same localities in these forests approximately at intervals of a century. Regeneration of the stands with fine trees would be likely to take place relatively rapidly as a result of the period of complete repose of the areas traversed by the fires, though naturally the rate of regeneration would not be identical for all kinds of trees.

RUBNER and HESMER (Germany) do not share the views of MÜLLER, and certainly do not think that any generalisation can fairly be deduced therefrom. They admit that surface fires on peat soils have been a contributing factor in the disappearance of the forests that formerly grew there. On the other hand they consider that the effect of fire on the very acid soils of primeval forests is not sufficient to explain the reproduction of fire ridden forests by trees of a single type.

BRASWET (Great Britain) has observed, in connection with the regeneration of the cedar in districts in Kenya which are particularly liable to forest fires, that as a rule the flora which grows after a fire consists mainly of *Juniperus*, *Olea*, *Podocarpus* and *Hemamelis*. The fallen leaves, twigs, etc. of these trees are even more highly inflammable than those of the cedar and hence there is frequently a recurrence of

fires in the same areas. Homogeneous regeneration of the cedar after burning over has however been observed but such cases are exceptional.

I,UNDMAN (Sweden), in discussing the less directly noticeable influences of fires on forest regeneration, has expressed the view that even simple surface fires which are generally looked upon as harmless, always in fact have certain effects upon the normal life of tree roots which probably results in a general weakening of the reproductive capacity of the whole stand. He also believes that after serious damage by fire on afforested lands, the ordinary level of the underground water table is frequently raised. HAGLUND, has also noted the same phenomenon and has come to the conclusion that the development of a large part of the peatlands in Sweden must have some relation to the fires which, at certain times, have caused the complete disappearance of the forests previously to be found in these areas. I,UNDMANN states that the chief difficulty found in the regeneration of burnt over forests with the finer trees is the marked change in soil conditions after a fire. Even the highest class of seeds, after germination in such soils suffer sooner or later from frost.

On steeply sloping lands erosion is the principal factor in causing a prolongation of environmental conditions unfavourable to forest regeneration. According to recent research, erosion does not merely bring about the mechanical dislocation of the surface soil layers but causes a general stoppage of the processes concerned with the circulation of air and water in the soil layers that have been evolved and the filtration capacity in burnt over lands is very markedly diminished. LOWDERMILK (United States) has succeeded, after very careful experimental work, in demonstrating that the principal function of the dead leaf soil covering is to maintain on wooded lands the infiltration profile which is locally the most advantageous. As it is well known that an intimate connection must exist between this profile and the plant growth of a climatic character established in a locality, it is easy to understand the importance of the fire factor among the other influences which contribute to a set back in the evolution of the soils and to a corresponding regression of the climatic plant growth therein developed.

COVENTRY (England) is of opinion that the disappearance of certain primeval forests in the Punjab (British India) and also the decline of well established species in the still existent forests cannot be properly attributed to any variations in climate which have become characteristic in the areas under observation, for such fresh climatic characteristics can only become evident after long periods of time. Consideration should rather be given to the results of forest fires which render the soil liable to erosion. In the Punjab the annual rainfall from July to September is usually abundant and this rainy season occurs immediately after the season of the forest fires. Chiefly as a consequence of accelerated erosion, climatic or primitive forests are replaced in the most favourable cases by forests which COVENTRY calls "colonisation forests", and these substituted forests show increasingly poor resistance to fire havoc.

LAVANDEN (France), who has studied the results of fires in the forests of North Africa, the Sahara and Madagascar also holds the view that the falling off of the forests in these countries is mainly the result of fires in the original forests where degenerate stands showing poor resistance to external risks have taken the place of the original forest and by their continued presence prevent the return of superior species and also frequently compromise any re-establishment of conditions reasonably favourable to any form of satisfactory forest regeneration.

In Australia too it has been observed that the flora which springs up on burnt over forest lands only rarely produces stands that are worthy of the name, this being

also the case where the fire has spared the mother trees of the better kinds. Reproduction by means of transitory species on fire swept areas is by no means satisfactory, the result being often an abundant development of undergrowth such as is very liable to catch fire.

Taking a summary view of the opinions expressed by specialists as regards the results of fire in forests worked under management schemes or relatively scientifically exploited, the conclusion is reached that the unfavourable influences, theoretically adduced for the cases of primitive or natural forests, remain valid to-day. In the State of Montana (United States) it has been observed that, when in the same area fires recur at intervals of not less than fifty years, regeneration of fire ravaged forests with trees of superior quality depends solely upon the fundamental soil characteristics, for in such periods a single fire would not have any very material effect. Naturally in such cases the best method of effecting regeneration is with the aid of the local trees, of which the seeds may be wind borne to the fire damaged areas.

In the Punjab, the suspension of the fire protection burnings that had been carried out for 20-30 years consecutively in the warm, damp areas, made it possible for fires to invade large continuous tracts and the result has been that fine forests have been replaced by stands of poor heavily foliated varieties with no market value. Such growths have been a serious hindrance to spontaneous regeneration with the sal tree (*Shorea robusta*) and teak (*Tectona grandis*) which were hitherto locally dominant.

In Norway it has been remarked that the most marked effects of forest fires as regards regeneration are chiefly to be observed at the upper limits of forest vegetation. This is a matter of very great importance in respect to the ecological conditions of these areas and is a factor in causing the limit of forest growth to recede. Apart from the question of altitude, the forests re-established on poor, shallow soils are threatened with extinction as a result of fires. The question of regeneration, even of the artificial kind, in such forests, is particularly difficult for the effects of fire on poor soils often lasts for a very long period.

Turning to the question of the means available to the forestry expert for reducing the disastrous effects of fires on forest stands, LARSEN of the United States is of opinion that only the careful observation of the true conditions of the soil which has to be restored can lead to practical results in the very different circumstances of individual cases. He recommends that an exact account should be kept of: (a) the local conditions and elements in regeneration which were effective before, during and after the fire, i. e., the topographical conditions, the fundamental composition of the soil and the characteristics of the local climate; (b) the age, the composition and the density of the burnt over forest. The age of the forest has a very marked influence on forest regeneration, by reason of the fact that the best germinating seeds come from fully mature trees and hence the escape of a few mother trees in good condition would in itself represent a reconstituent factor of first rate value. The season when the fire takes place also requires attention, for if a fire occurs at the time when the mother trees are bearing fully matured seed, it is quite possible that a large number of seeds will be productive after the fire; (c) the complex consequences deriving from the increased penetration of air in the soil after a fire, including the rapid changes in the temperature of the surface and of the upper layers and the radiation phenomena connected therewith, the chemical and biochemical effects of daylight on soil which has for a long time been completely in shade, etc.

These observations should make it possible for the forester to have a knowledge in advance of the means at his disposal which will enable him to neutralise the fac-

tors which retard and to utilise those which are favourable to regeneration. In the light of these observations he should be able to judge which is the most suitable time for making a first clearing of the burnt over areas with the object of releasing the seedlings of suitable species, which have sprouted on the soil surface of the undergrowth or of the young temporary stand. LARSEN emphasises the necessity for a careful treatment of this temporary growth so that it may be utilised for assisting in the reconstruction of the type of stand which had formerly naturally established itself on the spot. As this growth should be regarded as a parenthetic phase in the life of the permanent stands, it must not be allowed to exhaust all the resources of the soil. Where circumstances are favourable it is also possible to hasten artificial regeneration in forests which have been damaged by fire by means of seeds, especially those of trees which in the early years of their existence serve to maintain the leaf canopy.

As regards the regeneration of burnt over coppice, the experts advise distrust of the sprouts which sometimes grow strongly and freely on stumps in the first years after the fire. In order fairly to estimate the true results of the fire, it is necessary to await at least a complete rotation and to compare the growth of the burnt over coppice regenerated by stump sproutings with that of the coppice. Experiments carried out in Switzerland by WILLIAM show that the loss of increment in fire ravaged coppice is felt for a long time after the occurrence of the fire, even in cases where the burning was confined to the tree tops and the stocks did not appear to have been damaged. For this reason it is recommended that a general cutting back of burnt over coppice should be made immediately after a fire. It is also highly desirable, after a coppice fire, to strengthen the reserve of saplings directly produced from seed, and intended at the time of the second revolution after the fire to replace to a large degree the earlier stocks. The same results for the trimming of coppice can be obtained by cutting the stocks below the level of the soil, thus assisting the production of sprouts independent of the parent stock at the ends of the horizontal roots. This system however can only be followed in the case of certain species.

In the present state of knowledge regarding the regeneration of burnt over forest it is only possible to arrive at a single positive conclusion and that is that absolute repose is an elementary necessity if the difficulties of reconstruction work are not to be unnecessarily increased. In many cases these difficulties can be reduced by careful observation of the capacity for recovery still possessed by soils which have suffered from fire, but in any case repose is absolutely essential. The recurrence at brief intervals of fires in the same localities serves as a general indication that the process of deterioration in the original stands is still at work.

S. CABIANCA.

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## Notice.

MEETING OF TIMBER EXPERTS AT THE LEAGUE OF NATIONS, GENEVA, APRIL, 1932.  
— A meeting called by the League of Nations took place at Geneva on 25-27 April for the consideration of the present situation of timber production and trade and the provisions of an international character that might be adopted for the improvement of the present difficult conditions of the timber market. The International Institute of Agriculture took an important part in the meeting, being represented by members of the staff and also contributing a full documentation, statistical, technical and economic in character.

The experts were of opinion that the adoption by all the producing countries of the principle of a limitation of annual fellings to the actual woody increment might relieve the present crisis, which is due to the disproportion between production and consumption. In this connection the meeting passed a resolution that the International Institute of Agriculture in Rome should be requested to make a detailed study of the question and endeavour to collect all the documentation required for the consideration of the possibilities of drafting an International Convention for the purpose of securing the observance of the principles of a proper system of exploitation in all European and extra-European countries.

At the same time the experts considered that the only effective method of immediate relief is to be found in the adjustment of the amount of timber exports for all exporting countries to the diminished capacity of consumption in the importing countries by means of an amicable agreement between the exporting countries. As regards the trade negotiations required for bringing about such agreement, it was decided that a meeting should take place at Vienna on 9 June 1932 at which representatives of the principal exporting countries and of the International Institute of Agriculture would be invited to be present.

There were present at the Geneva Meeting experts representing the following countries: Austria, Canada, Czechoslovakia, Finland, France, Germany, Great Britain, Italy, Latvia, the Netherlands, Poland, Rumania, Sweden, Switzerland, the U.S.S.R. and Yugoslavia.

V. D.

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### AGRICULTURAL SCIENCE AND PRACTICE

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#### GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

##### Protection of the plant breeder's rights.

IMPORTANCE OF THE PROBLEM. — Speaking of the American project for granting patents to plants, Thomas A. EDISON stated "Nothing that Congress could do to help farming would be of greater value and permanence than to give to the plant breeder the same status as the mechanical and chemical inventors now have through the patent law. There are but few plant breeders. This (the bill) will, I feel sure, give us many Burbanks".

There is no doubt that of all methods of improving agricultural economy, the most important is the use of better varieties of plants. Neither the rationalisation of labour nor the use of manures or improved systems can give as good results as those attained by the introduction of improved varieties. By this means production has been increased by 30 % during the last 50 years while production costs have not been appreciably influenced. It is estimated that the introduction into Germany of the Petkus rye alone, has given an increased crop valued at 150-200 million marks per year. When such sums as these are involved, it is surely both astonishing and unjust that the plant breeder should not receive adequate remuneration.

The increase of the crop, however, is not the only point of interest; it must also be made more regular by means of selection. In this connection mention may be made of the selection of resistant varieties by means of which many millions a year might be saved now spent in the struggle against diseases and enemies of plants, also of the selection of cereals resistant to lodging, varieties of tree fruits resistant to frost and general improvement in ecological adaptation, all problems of the greatest importance which have still to be carefully studied. There is also the difficult question of improvement of quality which has been so successfully carried out in the case of the sugar beet and tree fruits, but which is still far from fulfilment with regard to cereals. The percentage of sugar in beets has been increased by means of selection from 7.8 in 1815 to 17.18 today, and by simultaneously increasing the yield per ha, the quantity of sugar obtained has been increased by 300 per cent.

The production of new varieties, however, has to day no financial interest. Of all the millions gained by the agriculturist, thanks to the labours of the plant breeder, the breeder has received only a very modest recompense, indeed selection is often a very expensive hobby which calls for an altruistic devotion and enthusiasm. It is most unfortunate that, at a time when it is possible to protect by patent even the least important mechanical object and when the rights of the inventor are protected by national law and international agreements, the plant breeder who, by his work and intelligence produces enormous values, earns little and sees

even his name eclipsed by enterprising people who amass fortunes by the use of his discoveries.

The clear conception of what may be attained by selection and the methods to be followed to reach the end in view constitute the ideas in which the plant breeder has definite ownership. As long as the reproducer may make use of the plant breeder's name or of the variety created by him, he is profiting by the plant breeder's rights of ownership, while the latter, on his part, can less easily sell his original products owing to the competition of the reproducer.

Luther BURBANK resignedly declared that he would hesitate to advise any young man, however gifted and keen, to take up plant breeding as his life's work, so long as America has not taken steps to protect his incontestable rights to derive some benefits from his labours.

Plant breeding necessitates conscientious and persevering work of long duration, technical and practical knowledge and large capital, and entails many risks. This cost of producing a new and really good variety of cereal, for example, is estimated at 40,000 - 150,000 gold francs. It is the greatest injustice to refuse to the producer of a new variety, employing all his fortune, intelligence and energy, the protection which industrial inventors and authors of literature and art have enjoyed for so long. This protection would be of the greatest public interest inasmuch as it would stimulate the efforts of the plant breeder and open up new possibilities to him.

**DIFFICULTIES OF THE SOLUTION OF THE PROBLEM.** — It may be asked how it has been possible to remain inactive and to ignore such a situation for so long. The explanation is very simple. Selection, on a scientific basis, dates only from recent years, and it is only latterly that the methods employed have become more complicated thus raising the question of legal protection. It often happens that an idea is, as it were, in the air, and suddenly finds expression. The necessity for protecting the plant breeder in one way or another has thus suddenly made itself felt in every country at once. Many difficulties must be overcome, however, before this protection can be ensured.

Agriculture is essentially a biological industry, a point which has too often been forgotten during the rapid development of agricultural chemistry. The agriculturist has not taken sufficiently into account the delicate and complex vital functions of the plant. The plant breeder works with living objects, little suited to the less delicate methods employed in industry. It is therefore natural that the methods of protecting industrial inventions cannot be applied in exactly the same form to plant discoveries. The mere fact that in industry the patented object must always be made anew so that construction is continuously being repeated, while a new variety of plant, once produced, can easily be propagated and will even reproduce by itself, is a fundamental difference which is in itself enough to demonstrate that the protection of discoveries in the vegetable kingdom cannot be governed by the same rules as in industry.

It is an advantage to the plant breeders that there are varieties of cross pollinated plants which, owing to the segregation of the genes, degenerate very quickly, thus necessitating the frequent purchase of new selected seed. It is not, perhaps, mere chance that it is the selection of the sugar beet which has given the best results, also financially, because, as cross pollination is obligatory in the case of this plant the grower is obliged to procure new seed each year produced by the plant breeder. It is only thanks to the increase in the percentage of sugar, obtained by the activity of the plant breeders, that the sugar beet has been able to compete with the sugar cane and resist for so long a time.

Another difficulty arises from a certain opposition of interests between the grower and the plant breeder. If the plant breeder is to be protected by law, thus enabling him to obtain better prices for his products, the grower using the new varieties will have to bear the cost and also share the inconveniences inherent in legislative measures. It is natural that the grower, especially in times of crisis such as ours, should refuse to make the sacrifice. It is very unfortunate that such an opposition should exist between the plant breeder and the grower, whose interests should, on the contrary, bring them into close collaboration. There is, in fact, no reason for this opposition. For extensively cultivated plants, the increase of cost to cover the license rights asked by the plant breeder for the use and reproduction of his creations, would be very small, and as the farmer usually cultivates only part of his land with original seed the increase would be negligible. Moreover, free competition would prevent the plant breeder from making his demands too high.

POSSIBLE SOLUTION OF THE PROBLEM. — 1) *Study of the problem by the State.*

(1). *Official selection.* The State, representing the interests both of the plant breeder and the grower, should act as the intermediary between the two points of view. The State has, in fact, a double interest in guaranteeing to the plant breeders, on one hand, the remuneration they merit, thus stimulating the production of good varieties, and in procuring for the growers, on the other, good seed as cheaply as possible. The interests of the State are clearly set out in the report which accompanied the American bill on plant patents on its presentation to Congress. "The food supply of the Nation", it stated, "both from the viewpoint of the producer and the user, is of vital importance, and insurance against failure in that supply is necessary to public safety and national prosperity. Plant breeding and discovery, while in its infancy, is fundamentally connected with the Nation's food supply, and will, if encouraged and developed, be of incalculable value in maintaining public health and prosperity and in promoting public safety and the national defense".

It is strange that, although in all countries where agriculture is well developed, the State, in the public interest, obliges farmers to use male animals of superior and officially recognised quality in the breeding of horses, cattle and even goats, plant improvement is neglected in spite of the fact that for the progress of agriculture plant improvement is even more important than animal husbandry.

The simplest method for safeguarding the interests of the State would be for it to take over itself the control of the production of new varieties, as is being done with good results in Sweden, Bulgaria, the U. S. S. R. and Uruguay. It has been observed that in Germany, in the regions where small farming predominates, Government institutions are successfully worked. The reason for this is that the small farmer, with his conservative tenacity, does not generally accept novelties unless they are granted by the authorities and at a very favourable price. There are, however, in Germany, associations of small farmers who are themselves doing valuable selection work. In regions with a predominance of large farms private breeders forestall the Government institutions, because the large farmer readily recognises the value of good new varieties and is disposed to pay prices high enough to satisfy the plant breeder.

The private plant breeder cannot envisage all the problems of selection. Many problems entail such costly installations, methods and labour, and the results are often so doubtful or delayed, that the chance of profiting by them is too unsure and even unlikely. Thus the selection of certain fodder plants, of forest trees, selection with a view to increasing immunity and baking quality of cereals are pro-

blems which usually devolve on the State. It would also be advisable for the State to undertake the comparative tests of new varieties, which are difficult and complicated and entail an excessive amount of work and expense for the plant breeder. It would moreover be an advantage to take the tests out of the hands of the breeder and entrust them to public institutions which would publish results as quickly as possible in an impartial manner.

However, although a certain responsibility should devolve on Government institutions, it would be a mistake to sacrifice private selection entirely, which is what will rapidly occur if steps are not taken to prevent it. The great majority of experts are agreed that it is generally better to leave the initiative in plant selection to the rivalry between private workers. There can never be the same personal interest in a public enterprise as in a private one, the same courage and the same enthusiasm which are so essential to success in selection.

The private plant breeder then should undoubtedly work on his own initiative, which is so important for the public good; but at the same time means must be found for his satisfactory remuneration and for his protection, against the risk of his work being exploited by others. Up till now the plant breeder has been tempted to hold his new products for some years in order to propagate them and benefit by them as much as possible before others should propagate them and put them on sale at lower prices. There are, in fact, cases where breeders have made selections solely in order to increase their own crops and so as to prevent competition have refused to sell their improved seed.

If protected by an appropriate law, the plant breeder would be in a position to sell his products without delay and would profit not only by the sale of his original seed but also by that of the reproductions made by other persons to whom he had granted a license. It is hoped that in the United States the patenting of new plant varieties or discoveries will afford a sound basis for the investment of capital and will thus stimulate the production of new varieties by means of private capital. This development should be of considerable public benefit inasmuch as it will enable the plant breeder to sell his original products at better prices as the reproductions will also contribute to covering the cost of the selection work, thus distributing the expense of this more evenly — a primary condition for the reduction of the excessive cost of valuable new varieties.

2) *The initiative of the agriculturist.* — Agriculturists all over the world are in agreement that the intervention of the law, although with the best intentions, is inadvisable, and that it would be preferable to attain the desired end through private enterprise. Consequently, for some time past, in various countries, seed producers have combined to defend their legitimate rights with the aid of the competent representatives of agriculture, basing their claims on legislative measures already in force. In general, rather than directly protecting new productions, the indirect method has been employed, of allowing the breeders, on submitting to official inspection of their establishments and products to give certain designations to products after inspection which are refused to ordinary varieties. Some States grant favourable treatment, such as reduction of taxes and cost of transport, to these seeds. It is clear, however, that although this is a step in advance towards protection it is not sufficient.

The world war put an end to the first attempts to protect plant discoveries which were being made especially in horticulture. At last, in France, in 1921, the *Office National de la Propriété Horticole* was formed. The horticulturists, members of French horticultural societies, undertook to respect trade marks and regis-

tered names amongst themselves. The only penalty which could be enforced was exclusion from the society.

In Germany, in 1929, the Association for the Encouragement of Plant Selection in collaboration with the "Deutscher Landwirtschaftsrat" (German Council of Agriculture) representing general agricultural interests, introduced a system of licensing reproducers of original seeds. The charge was to be 6 marks per ha. only in the case that the reproducer desired to sell the reproduced seed using the name or mark of the breeder. The latter has the advantage, not only of taking the sum paid for the license granted, but principally of having his name and reputation protected. He is therefore glad of the mediation of a Committee which controls and certifies the reproductions, thus preventing the sale of faulty seed under cover of the plant breeder's name. This is equally and primarily to the interest of the buyer. The certifying ("Anerkennung") of the seed in the field by an official Commission is an essential point of the German bill for the protection of new plant varieties of which we will speak further. This is also done in the Netherlands where the certification forms a basis of protection for the plant breeder and the purchaser.

In Germany, only varieties inscribed in an official register kept by the German Society of Agriculture, can be certified. Similar registers exist in other countries. There are usually two: a provisional one in which note is kept of the variety for several years until its value has been clearly established: and a principal one where definite registration is made.

3) *Legislative Measures.* — The registration can be legally established, thus paving the way for special laws which are being prepared in several countries for the protection of plant discoveries.

In the Republic of Czechoslovakia, since 1921, the designation of certified seed has been subject to the law dealing with the identification of the origin of the varieties, the identification of seeds and plants and the examination of varieties of cultivated plants. Selection establishments may not assign names to certified seeds except in accordance with this law. In Hungary also, the legal regulations actually in force tend to protect selection by means of very severe official control of the selection Establishment and comparative tests of their products before approval. Thus, if a plant breeder has reason to think that another producer has put a variety in circulation identical with one of his own, he has the right to demand a comparative test for identification from the Improvement Association. The official attestation having been made the damaged breeder may substantiate his claims by legal means.

These measures, however, protect only names, and the discoveries themselves are not protected and *cannot be patented*. In order to remedy this state of affairs, the International Association of Plant Breeders, which now counts its adherents amongst 32 countries, has put the question of legal protection for plant discoveries on the agenda for its General Meetings. The various members do their best in their respective countries to get these discoveries recognised on the same level as industrial inventions.

Their claim has been satisfied in the United States by the law of May 23, 1930, concerning plant patents, but with this fundamental modification. The American law is limited to asexually reproduced plants, but further excepts from the right to a patent tuber-propagated plants, the law thus applying in practice only to new horticultural varieties. As a matter of fact the principle of patenting is more applicable to plants reproduced asexually, especially to those of which the part used in commerce is not that which serves for reproduction. According to this

law, the essential condition for obtaining a patent is that the discovery should present an entirely new characteristic. The value of the discovery is not taken into account. This viewpoint is admissible for horticultural plants, appreciation of which is largely a question of taste and consequently variable and uncertain. It would be however of no advantage for world agriculture if agricultural patents were to be granted as easily as are industrial patents.

The first patent based on the American law was granted on August 18th, 1931. It dealt with a climbing rose. It was followed in October 1931 by three other patents, the last of which was for a "Young" spineless bramble. This patent brings us for the first time into the domain of fruit culture, and it is the fruit grower more than anyone else who may hope to derive considerable profit from this law when it is completed and when its application has been defined by judicial practice. Agriculture, properly speaking, will not profit greatly.

More comprehensive laws have for some time been in preparation in France and Germany. They differ fundamentally from the American law inasmuch as they aim at extending legal protection to new varieties of all kinds of cultivated plants. The French law does not otherwise differ very greatly from the American. It also specially protects horticultural interests as appears from the composition of the *Office de Propriété Agricole et Horticole* in which the majority of the members will be horticulturists.

According to the French project, it is necessary and sufficient for the granting of a patent that the plant in question should present new characteristics. The patent will be granted without taking into consideration the value of the discovery. A variety which has already been put on the market before the demand for the patent is made, cannot be patented.

During the international negotiations on the subject, Germany, where a considerable amount of private selection is done, has undertaken to formulate a law to serve as a model for the protection of discoveries. When this question is settled in Germany, an international conference will seek to establish international regulations based on the German experience.

The outline of the German project is the following: All new plant varieties attained by means of selection will, on demand of the originator, be inscribed in a public register and will be protected for his benefit. In dealing with cases produced by selection of varieties already existing on the market, it will be essential for registration purposes that they should show a marked superiority over the varieties from which they are derived. Varieties on the market at the time the law comes into force may be equally protected for the originator provided the latter can prove that they are independent varieties produced by selection. The plant breeder will then be able to prevent other growers from profiting by his name and reputation in the reproduction and sale of plants. The breeder will have the right to sell his seeds qualified as "original" only when the variety is registered. Whoever reproduces the original seeds for sale must obtain the permission of the breeder to use his name or mark and must pay him accordingly. If it is found absolutely necessary for the advancement of the agriculture of the country, the State can insist on the breeder ceding the rights of reproduction to the State on payment of an appropriate indemnity. The project provides for fines and even imprisonment in case of infringement.

The German project avoids the word "patent". It does not, in fact, deal with the protection of a certain procedure for the production of discoveries, but with the protection of the discoveries themselves, which, once produced, may be propagated as desired and with the greatest facility without repeating the very

complicated and costly procedure of the first production. The word "patent" is therefore inappropriate and misleading. A solution of the problem has been sought in the combination of an official registration of new varieties and the certifying of their cultures, thus forming the basis for protection and enabling the plant breeders to reap the profit of their discoveries by means of a licensing system.

In France, there has been a tendency to adhere to the system of patents. The decree of December 5, 1921, however, instituting a register of selected plants, contains a stipulation which, combined with the proposed measure, will be as efficacious as the German measure. Art. 4 of the decree stipulates that, in order to be included in the register of selected plants, the variety must present not only new but unquestionably valuable characteristics, to be confirmed by cultural tests. Unfortunately this register has so far been opened only for wheat. With regard to this cereal the French decree of March 26, 1925, which aims at the repression of commercial fraud in the sale of wheat seed, approaches still nearer to the projected German law. This decree states that only those wheats which have been attained by individual selection may be qualified as "selected", while in the German project the qualification of "original" is reserved for registered varieties, registration serving as a guarantee of the value of the variety. The particularly interesting point of the German system is the *licensing system* already mentioned; that is to say, the obligation of the reproducer to procure, by means of adequate remuneration, the permission of the plant breeder to make use of his name and reputation. This obligation, which is usually limited to first and second reproductions, is extended to a larger number of reproductions in the case of the potato. Growers' interests are safeguarded not only by a series of articles dealing with the certifying and the sale of seed, but also by the stipulation obliging the breeder to grant permission for reproduction to anyone offering appropriate recompense. Moreover, this permission is superfluous in the case of direct exchange between the breeder and the grower without trade intervention and without employing public means of transport. A similar measure is contemplated in France.

INTERNATIONAL ASPECT OF THE PROBLEM. — The protection of plant discoveries is likewise of the greatest international importance.

If the protection of plant discoveries is realised, as in the United States, by a simple amendment of the laws dealing with industrial patents, they will automatically be included in the international agreements regarding those patents. The International Conference of Paris on March 20, 1883, which was signed by all the States taking part in the Union for Industrial Protection, regulates international relations on this subject. Besides this, the American Plant Patent law stipulates that new varieties or discoveries can qualify for patents only if they have not been patented or described in any country for two years previous to the demand. This protects the American breeder from competition created by the importation of foreign discoveries and the foreign breeder against the theft of their rights of ownership and their exploitation in America.

International protection of authors' literary and artistic rights is based on the Berne Conference. In order to hold a public performance of a musical composition, for instance, a certain percentage of the gross receipts of the concert or an agreed sum is paid to the bureau which represents in that country the Society of Authors of which the composer is a member. The Society undertakes to safeguard the rights of the author, and its members in the various countries will exercise the necessary control and proceed against all violations of the author's rights. International protection of plant breeders could perhaps be realised along these same

lines as proposed by Prof. Dr. Alois TAVČAR at the XVth International Congress of Agriculture (Prague, 1931).

The German project grants protection to foreign plant breeders on condition that German varieties should be accorded a like protection in the respective countries. Hungary has adopted the same principle. In France, foreigners may be granted agricultural and horticultural patents. Until international agreements have been reached, the patents granted in France will have value only in France. Moreover a French citizen cannot purchase from a foreign producer or dealer varieties which are protected in France but not in their own countries.

M. BROCKEMA (Netherlands) has proposed an international agreement principally based on only two clauses:

1) The contracting nations undertake to grant the same protection and the same rights to foreign discoveries as to their own.

2) If a country participating in the agreement complains that a variety has been certified in another participating country under the same name or another but in reality identical with a variety already certified in the first country, the complainant may appeal to an International Bureau which will form an arbitration committee.

There are in many countries, as already stated, official registers of selected plants. The next step is to give legal protection to these registers, after which there will be nothing to prevent the registration of foreign varieties. Such registration would be greatly simplified if an international model for description of the varieties could be used uniformly in all countries. Valuable preliminary work has already been done on this subject.

The first international registration of agricultural varieties will be made for wheat, in the form of the International Catalogue of the Best Wheats which is shortly to appear under the aegis of the International Association of Plant Breeders. The preparation of this work, based on communications from members of the Association in various countries which are transmitted to M. VERCHÈRE (Paris), is well advanced.

There actually exists an International Bureau for the registration of horticultural discoveries in close connection with the "Fédération horticole professionnelle internationale". It is well organised, but few declarations of horticultural discoveries reach the Bureau. This is due to the fact that, as the originator is not protected by law, priority of declaration has only a moral value.

We will refrain here from any reference to the difficulties which any law for the protection of plant discoveries is bound to create. It is quite natural and just that the agriculturist should desire to keep the legislator out of his affairs. The law, in a certain measure, however, is necessary in order to maintain a just equilibrium between the divergent interests and to safeguard the interests of the public. The present situation demands a protection and encouragement of the private plant breeders similar to that which the laws on patents have accorded to industrial inventors, and any difficulties which may arise must be courageously met. A new subject necessitates the application of new ideas, and these have always and everywhere aroused opposition in minds of a more sceptical or conservative cast. The greatness of the task imposes on us the obligation of finding a solution, even one which, at first sight may appear audacious.

It is all these considerations that led the XVth International Congress of Agriculture at Prague to recommend:



" That the International Agricultural Commission and the International Institute of Agriculture should unite their efforts to those of the International Association of Plant Breeders to obtain that new plant varieties be everywhere assimilated to other inventions protected by patents ".

N. VON GESCHER.

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## TROPICAL AND SUBTROPICAL AGRICULTURE

### Review of the more important publications on rubber culture issued in 1931. (Part II). \*

#### TAPPING.

In a previous review statistics were given of the use of the different tapping systems in Java. Statistics of the systems in use in Malaya have been given by GRIST (26). The figures relate to 744,760 acres or 97 per cent of the total area of plantations larger than 100 acres, viz. 615,950 acres in the Federated Malay States and 128,810 acres in the Straights Settlements. The area under the three different

(\*) See Part I in this Bulletin, 1932, N. 5, pp. 163-170.

systems, — alternate daily, daily, and A. B. C.-systems — expressed in percentages were for the F. M. S. : 73.1 %, 6.5 % and 20.4 %, and for the S. S. : 59.3 %, 19.3 %, and 20.6 %.

The low prices of rubber have given another aspect to the question of which tapping system is the most profitable and a system which involves lower tapping costs may at present be preferable even if it would give a smaller yield. This consideration caused the investigation of other systems in addition to those generally applied.

The most popular tapping system in Java during the last few years has been tapping over  $\frac{1}{3}$  circumference every other day ; it superseded the system of tapping over  $\frac{1}{2}$  circumference every other day, which was abandoned on account of the greater bark consumption. This disadvantage is avoided if the tapping over  $\frac{1}{2}$  circumference is done every third day and TENGWALL pointed out (27, 28) that the labour cost of this system is considerably lower. An experiment in which both systems —  $\frac{1}{3}$  every other day and  $\frac{1}{2}$  every third day — were tried in 17 tapping tasks on 11-year-old trees, showed that the yield is the same and also the occurrence of brown bast. TENGWALL considered therefore the system of  $\frac{1}{2}$  every third day advisable.

It was, however, pointed out by a planter (29) that in his opinion this system would not allow of giving the tappers a greater number of trees because the tapping task is limited by the quantity of latex collected. This latex must be carried by the tapping coolie to the factory and it should not be more than one tin of 16 litres. Tapping is often successfully done by women and the latex collected has often to be carried over long distances.

Against this objection TENGWALL pointed out (30) that it would be a wrong policy to make the number of trees to be tapped per coolie dependent on the quantity of latex collected. It may be considered a fortuitous coincidence that up till now one tapper collected a quantity which was not too large for him to carry to the factory, but if this quantity increases either by using a more economic tapping system or by the increased production of the trees, it would be a wrong policy to stick to the old arrangement that the tapping coolie has himself to carry the latex to the factory, and to declare a tapping method unsuitable if it enables the coolie to collect more latex than he can carry. TENGWALL figured out that even if a helper is given to each tapping coolie for the transport of the latex the system of one cut over circumference tapped every third day remains the most economical. This opinion was shared by others (31).

The Rubber Experiment Station made the suggestion (32) that it might perhaps be possible to economise still more on tapping expenses, if a drastic tapping system was followed — for instance two cuts over  $\frac{1}{2}$  circumference daily tapped — during one month with a long resting interval, say, of three months. It is still uncertain what yield would be obtained with such a system, but it was found that when such a tapping system was started very high yields were obtained in the beginning. The yield of the first month when the system of 2 cuts daily over  $\frac{1}{2}$  circumference was followed amounted to 4 times the yield obtained with one cut over  $\frac{1}{3}$  every other day and 2 to 3 times that yield if the same system was applied every other day. If this ratio were the rule these new systems would give the same yield as the old system while requiring much less labour. For the present however, we are still uncertain about the yield to be obtained with the drastic system and the Rubber Experiment Station in Java has suggested to the planters to carry out experiments in order to obtain exact figures.

Not the system of tapping only influences the yield but also the way in which

the tapping operation is performed by the coolies. It is a well known fact that to a certain extent the average yield per tree is higher when the number of trees per coolie is smaller. This is caused partly by the greater care taken by the tapper when the task is small and partly by the fact that tapping is finished at an earlier hour. Up till now reliable figures of the yield per tree obtained in tasks with varying numbers of trees have been scarce but such figures have now been obtained by careful experiments in Sumatra (33).

These experiments showed that if the average yield per tree obtained with a task of 380 trees is assumed to be 100, the following yields were obtained with smaller tasks : with 345 trees 106, with 317 trees 109, with 292 trees 116, with 253 trees 119.

New data concerning the results obtained with the main tapping systems in use were published by VAN BAALEN (34). The systems investigated were :

- A) every other day tapping over  $1/2$  circumference
- B) every other day over  $1/3$
- C) every third day over  $1/2$ ,
- D) periodically (20 days) over  $1/2$ , and
- E) periodically (30 days) over  $1/3$ .

The great importance of these experiments carried out on a plantation in South-ern Sumatra, lies in the fact that they were done very carefully and over a period of 6 years (April 1925 to June 1931). The trees were planted in 1919-1920 from unselected seeds at a distance of  $6 \times 6$  metres.

The relative yields obtained with the different tapping systems in the first year, in the last (6th) year and over the whole period of 6 years is to be seen in the following table, in which the yields are expressed in percentages of that obtained by system A (every other day over  $1/2$ ).

TABLE I. — *Relative yields of the experimental blocks.*

Tapping system	1st experimental year (trees 5 years old)	6th experimental year (trees 10 years old)	over the total of 6 experimental years
A) Over $1/2$ every other day . . . . .	100	100	100
B) Over $1/3$ every other day . . . . .	74	100	87
C) Over $1/2$ every third day . . . . .	79	84	88
D) Over $1/2$ periodically (20 days) . . . . .	101	105	105
E) Over $1/3$ periodically (30 days) . . . . .	78	108	92

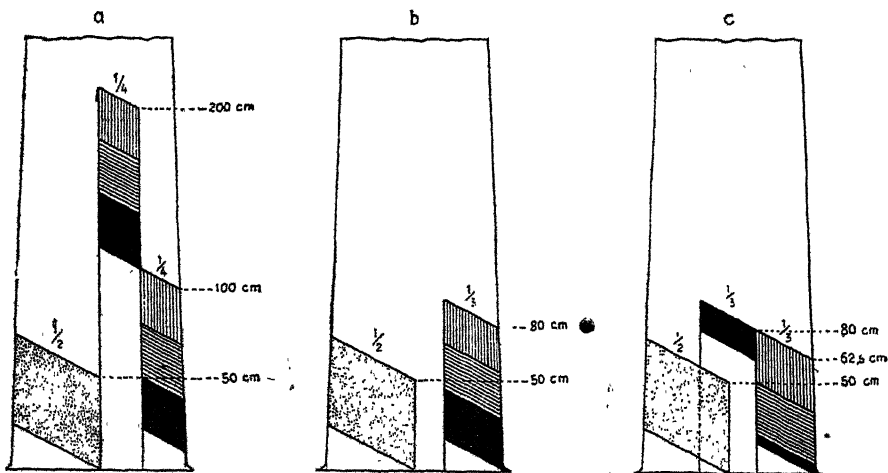
It thus appears that the periodical (20 days) tapping system over  $1/2$  gave the highest yields. It is interesting to see that the relation between the moderate tapping systems (B, C, D) and the more drastic systems (A and E) changes gradually in the course of the years in favour of the moderate systems. So these three (B, C and D) gave in the first year a yield of respectively 74 %, 79 % and 101 % of the yield of A, but in the 6th year the relation was 100 %, 84 % and 105 %. If we take into consideration the bark consumption, we must consider together the groups A and D in which the bark consumption is about equal and also the groups B and C with a bark consumption of only about  $2/3$  of that of A and D. Of the first group the system D had a slightly higher yield and the periodical (20 days) system is thus to be preferred to the every-other-day system, in the second group the system E of tapping over  $1/3$  periodically (30 days) gave the higher yield.

On account of the great bark consumption and the rather large number of cases

of brown bast the methods in which  $1\frac{1}{2}$  circumference is tapped, either every other day (group A) or periodically (group D), are not to be recommended.

In the F. M. S. the ABC-alternate-day-system is still of interest and HARRISON (35) gave a few details about the results obtained on a large area. In this system the trees are tapped alternate-daily during a period which is the double of the resting period, so that the whole area is divided into three equal parts, two of which are tapped every other day while the third is resting. In the present case the trees were tapped on alternate days for twelve months and the rest lasted six months. In comparing this ABC-system with the ordinary system of tapping (continuously on alternate days) HARRISON found that the yield proportions are 477 lbs per acre against 500 lbs per acre, thus 4.6 % of the crop is lost by using the ACB-system but  $33\frac{1}{3}$  % of the bark is saved and an equal part of the labour expenses. Besides it is unlikely that the area tapped on the old alternate-daily method would have continued to yield at the high rate of 500 lbs per acre, because the bark position would have forced the cut to a height of at least 48 inches (120 cm), whereas, with the ABC-system a rapid renewal takes place during the rest, so that it will never be necessary to go higher than 26 inches (65 cm) or at the most 30 inches (75 cm).

*Experiment with the HEUSSER tapping method for budgrafts with 2 cuts over  $1\frac{1}{4}$  circumference, showing the position of the panels in the 3 series of trees during the 3 years of experiment.*



a = New double cut system

b = Control budgrafts

c = Seedlings

Dotted area = preliminary tapping

Vertically hatched area = 1928 experimental tapping

Horizontally hatched area = 1929 experimental tapping

Black area = 1930 experimental tapping

In the previous review the new method, advocated by Jules Bosch in Java, was mentioned and the observation made that it had not yet been investigated thoroughly.

Such investigations have since been carried out (36, 37, 38). The experiments of TENGWALL in West Java as well as those of S'JACOB in East Java demonstrated that neither the method nor the tapping knife are recommendable. The yield obtained is smaller than that obtained by the ordinary system of tapping over  $1/2$  circumference alternate-daily or alternate halfmonthly and about the same as the yield obtained by tapping over  $1/3$  circumference, while the tapping costs of the BOSCH system are considerably higher. The BOSCH tapping knife has no advantages and is much more expensive than the ordinary knife.

New data have been collected about the interesting HEUSSER tapping system for budgrafts, in which two cuts were applied over  $1/4$  circumference. The system has been described in the two previous reviews (see this *Bulletin*, August 1930, p. 297 and July 1931, p. 259 T). HEUSSER and HOLDER published (39) the results of the third experimental year, in which again 100 budgrafts of each of the clones AV 51, AV 80 and AV 65, 50 budgrafts of clone AV 53 and 2 groups of 200 seedlings of selected seed were included. Tapping was again done alternate-monthly. The situation of the panels for the three experimental years on the three experimental groups — budgrafts tapped with the new system, budgrafts tapped over  $1/3$  circumference with 1 cut, and seedlings tapped with this same system — is given in the preceding figure.

It may be remembered that the seedlings were planted in October 1922 and the budgrafts budded in the field in the same month.

The annual production in kilogrammes of dry rubber per tree is shown in Table II.

TABLE II. — *Annual Production of Dry Rubber per tree, in kg.*

Experimental year . . . . .	1928		1929		1930	
	1 × $1/3$	2 × $1/4$	1 × $1/3$	2 × $1/4$	1 × $1/3$	2 × $1/4$
Seedlings . . . . .	1,5	—	2,3	—	3,2	—
Clone 51 . . . . .	2,2	3,0	3,2	4,8	4,2	6,5
Clone 80 . . . . .	2,0	3,2	3,5	4,6	4,6	6,7
Clone 65 . . . . .	2,8	4,4	3,2	4,9	3,9	7,6
Clone 53 . . . . .	3,6	—	4,2	5,2	5,5	8,1

In thus appears, that the ratio of the yield of the budgrafts tapped with the old system to the yield of the seedlings in the three consecutive experimental years lies between 1.4 and 1.8, 1.4 and 1.8, 1.3 and 1.7. Speaking generally, the budgrafts yielded about  $1\frac{1}{2}$  to 2 times as much as the seedlings. The new 2-cut method gave in the first and the second experimental years  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as much as the old 1 cut system, and in the third year  $1\frac{1}{2}$  to 2 times as much. Comparing the yield of the clones tapped with the new system with the yield of the seedlings, we find in the third experimental year the following ratios: 2.03 (clone 51), 2.20 (clone 80), 2.33 (clone 65) and 2.38 (clone 53).

The ratio of the production of the lower and the upper cut remained about the same; the upper cut gives 88 to 92 per cent of the yield of the lower one.

As regards the occurrence of brown bast, it seems that in clones 51, 80 and 65 the new system gives more brown bast than the old one, but less in clone 53.

The HEUSSER tapping system was also tried in the F. M. S. (40) and close agree-

ment was found between the results there and those obtained in Sumatra. The clone Prang Besar 23 appeared to respond especially well to two cuts on a quarter, yielding at the rate of over 3 lbs per tree more than on a single half cut.

#### REPLANTING OF THE FIELDS.

The question of replanting or rejuvenating the rubber fields is still a matter for animated discussion between the scientists of the Experiment Station and the planters in Java and Sumatra.

In these days of low prices it is of the utmost interest to have fields which have been planted with illigitime seedlings with a rather low average yield, replanted with budgrafts of the best clones.

The main questions are : (1) Is it desirable to leave the best yielding trees and to replant only the trees of mediocre and of poor yield, or is it better to have the whole field replanted as soon as possible ? (2) Does it pay to have the trees tapped during some two years with a drastic tapping system in order to obtain the maximum amount of rubber before they are removed, or is it better to have the field replanted as soon as possible with budgrafts of superior clones ?

S'JACOB discussed these questions thoroughly and gave many data to support his view that speaking generally the most economical system is to replant the whole field at once, cutting away the old trees without applying any drastic tapping system (41).

He argued that in cutting away the medium and poor yielders and keeping the best trees standing the production of these last does not show an important increase, at any rate not enough to justify their taking the place of a certain number of superior budgrafts. Moreover the growth of the budgrafts planted in the neighbourhood is considerably hindered. And, as regards the drastic tapping, it must not be expected that in this way the yield will be trebled, for it will be highly satisfactory if in the first year 250 % and the second year 200 % of the ordinary yield is obtained. If this is taken for granted, we can calculate what yield can be expected if the drastic tapping is applied during two years and what yield if budgrafts of superior clones are planted immediately. Assuming that in a field yielding 350 kg per year the drastic tapping will produce 875 kg per ha the first year, and 700 kg the second year, and further assuming that the budgrafts will yield in the 6th year 200 kg, in the 7th year 450 kg, in the 8th year 650 kg, in the 9th year 850 kg, in the 10th year 950 kg and in the 11th year 1050 kg, we find that after 10 to 11 years the field in which the budgrafts have been planted has produced about the same quantity as the field in which the old trees have been tapped drastically for 2 years, and that from that time the field with the two years older budgrafts gives a considerably higher yield than the other.

But S'JACOB agrees that the system of immediate planting of budgrafts presents difficulties on estates which are insufficiently supplied with cash money. Also in cases in which a larger area has to be replanted than can be done in one year, it may be economical to plant as large an area as possible with budgrafts and to apply the drastic tapping in another part of the area.

The idea of S'JACOB that the yield obtained with drastic tapping is often over-rated has been confirmed by figures supplied by AMENT (42). In the experiments which he records the drastic tapping method (tapping with 2 cuts over  $\frac{1}{2}$  circumference) gave in the first year surplus yields of 52.5 %, 18.3 %, 35.6 %, 120.4 %, 54.9 %, 238.4 %, 99.4 %, 209.5 % and 171 %. The surplus yields which DE HAAN (44) obtained were much better, but still lower than would be expected, viz. in the

first year 125 per cent to 180 per cent of the ordinary yield. Nevertheless VOLLEMA (41) considered a surplus of 250 % in the first year and a similar surplus in the second year as by no means exceptionally high for fields in good condition and well yielding. On the other hand he was of the opinion that the drastic system required rather much labour and he figured out that with the ordinary 1-cut-alternate-daily tapping the coolie has  $2 \times 300 = 600$  trees in his task, while with the 2 cuts daily tapping 3 tapping coolies are needed for these 600 trees.

The opinion that most of the estates cannot dispense with the yield obtained from the old trees by a drastic tapping system is shared by different planters. The usual tapping system of "2 cuts over  $1/2$  circumference daily" has the drawback of easily inducing brown bast, especially of the upper cut, therefore the system of 1 cut over  $3/4$  was recommended by NIEUWPORT (43).

### SELECTION.

There is still insufficient information about the extension of the area planted with hevea-clones and seeds of selected parent-trees. The inquiry of the A. V. R. O. S. Experimental Station in Sumatra amongst the estates in Northern Sumatra (East Coast of Sumatra, Atjeh and Tapanoeli) is therefore very welcome (45). From this inquiry it appears, that at the end of 1930 279,260 ha were planted with hevea; 40.6 % of this area was planted with selected planting material and 59.4 % with unselected material. Of the selected material 43 % consisted of budded plants, 40 % of a mixture of budded plants and selected seedlings, and 17 % of selected seedlings.

The first step in all selection work is the selection of the mother trees. The way in which this must be done has been a subject of much discussion in Java. Generally trees which are supposed to be high yielders are kept in observation during one or two years; during this time yield records are made and the susceptibility to wind and to diseases, especially brown bast, is investigated. Some planters are of opinion that continued observation during a longer period would be advisable in order to obtain greater certainty as to the value of the tree (46). The scientific workers of the experiment stations are of another opinion. OSTENDORF pointed out (47), that among the superior and high yielding mother trees only a small percentage produce high yielding descendants and that this circumstance makes it necessary to select regularly a large number of mother trees and not to spend more time than is absolutely necessary on the testing of mother trees.

Budwood of clones of high productivity has become a product of commercial importance and the way in which it must be packed to keep it as long as possible in fresh condition has been the subject of experimental work. Another subject of investigation has been the question of how budwood can be disinfected without harmful effect to the viability of the buds. This was an urgent question in Malacca in view of the existing legislation with regard to plant quarantine measures. NAPPER (48) investigated it on budwood of the clone "AVROS 50" and tried different disinfectants in which the budwood was immersed for 2 or 5 minutes, after which time it was either washed in water or left unwashed; then the budwood was packed with the ordinary precautions and stored; after a certain time the condition of the budwood was investigated on the rate of die-back, and the viability of the buds was tested by using them for budding. The following table shows intensities at which the various fungicides under investigation may be used to disinfect budwood from clone AVROS 50 without any resultant injury to the buds:

TABLE III. — *Concentration of fungicides for use on budwood.*

Fungicides	Time of immersion	Strength	Washed (w), or unwashed (u)
Solbar . . . . .	2 minutes	2 %	u
Solbar . . . . .	5 "	2 %	w
Lime sulphur (B) . . . . .	5 "	1 %	?
Sulfnette . . . . .	5 "	2 % (3 % ?)	?
Liver of sulphur . . . . .	2 "	1 %	u
Liver of sulphur . . . . .	5 "	1 %	w
Ammonium polysulphide . . . . .	2 "	3 %	u
Ammonium polysulphide . . . . .	5 "	3 %	w
Uspulun Universal . . . . .	2 "	1 %	u ?
Copper sulfate . . . . .	The effect was deleterious even in the weakest treatment (2 % during 2 minutes).		

Further sulphur dust was used as a disinfectant by including it in the packing fibre; the inclusion of 1 lb of sulphur dust in the fibre required to wrap 6 sticks had no serious effect on the buds.

A short paper was issued about the budding routine at Nivitigalakele (49). The methods used seem not be different from those followed in Java, Sumatra and Malacca.

A slightly modified budding method was published in the *Bulletin du Syndicat des Planteurs de Caoutchouc de l'Indochine* (15 July 1931, p. 315) (50). In this method no paraffin waxed tape is used to fix the bud, which is done by means of a small piece of bamboo, fixed to the stock by means of galvanized iron wire (1). This method was tried by the A. V. R. O. S. Experiment Station in Sumatra and found to be very practical. It has the advantage of being cheaper than the old paraffined tape method.

If new buds are applied to the stock, when those first applied have not succeeded, one is obliged to place them rather high above the soil and in transplanting into the field it is necessary for the stock to be planted quite deeply if it is desired to get a stem belonging entirely to the scion. As SNOEP showed (51) there is nothing against this measure, the stock in this case easily forming a new root system by means of strong adventitious roots from the upper part of the stock.

The method of budding in the field instead of in the nursery retains its interest, especially with a view to converting fields planted with seedlings into fields with budgrafts of selected clones. HOLLAND (52) investigated the percentage of success with budding in the field under different conditions. He could not find any apparent advantage in the stock being in a state of active growth at the actual time of budding; in this respect his results are in contradiction with those obtained in Java by DE VRIES with his budding-experiments in the nursery (see this *Bulletin* 1931, No. 7, p. 265 T).

Considerably greater success was obtained by HOLLAND by budding on vigorous one-year-old stocks in the nursery than on stocks of two years old or more in the field. According to VOLLEMA (53), however, even seedlings of 5 to 8 years — but not older — may be successfully used as stock for buds, and in more than one estate seedlings of this age have been successfully budded with buds of selected clones. Nevertheless it may be considered questionable whether a radical rejuvenation is not to be preferred to the budding of the old trees. Both systems have their advantages and disadvantages which need not be again described here.

On one of the estates in Java a field of 3-year-old trees was budded and after the bud had grown together with the stem, the stem was not cut off as is generally

(1) For details of this method see this *Bulletin*, 1932, No. 5, pp. 171-172.



done but only girdled. The budding operation had been performed shortly before the cessation of the rains and it was expected that the new sprouts would be better provided with water if the stem was girdled instead of being cut off in the ordinary way. This expectation proved to be incorrect and many of the sprouts began soon to suffer ; after the cutting away of the stem the majority recovered (54).

It is well-known that, when the stock is cut back, die-back fungi of various types enter through the exposed wood surface, if no protective material is applied. This is especially the case when rather old trees are used as stock. SHARPLESS and MANN (55) give the following recommendations to avoid this trouble. If the stock is not more than 18 months old, ten days to a fortnight after opening the budding the stock should be pruned back to within three to four inches above the level of the bud-patch. On the day following pruning the cut surface should be fully covered by a layer of a mixture made up of Asphaltum 2 parts and Kerosene 1 part. Given normal growth, after about six months, the lower portion of the scion shoot shows the development of the brown colour (cork formation) to a height of about 2 feet from the union. At this stage the second and final pruning of the stock should be carried out at the limit of the living tissue, marked by an external ridge, so as to remove all dead tissue above. The newly exposed wood surface must again be protected immediately after the pruning is done, and the coolie performing the operation should paint the fresh cut with either 20 per cent solution of ' agisol ' or ' brunolinum plantarum '. On the following day the cut surface is covered as before with a complete layer of the asphalt-kerosene mixture.

Buddings on stocks older than 18 months must be treated in a slightly different way. The different clones show important differences in the development of the bud and the growth of young stems (56). In some clones the buds develop quickly after the removal of the stem of the stock — this, for instance, is the case with the clones BD2 and BD10 — in others, for instance in the clones Ct. 88, War I and BD5, the development is rather slow. Also the rate of development of the young stem is characteristic for the clone ; in general it is proportional to the rate of development of the bud. The growth of the young stem is not continuous and periods of growth alternate with periods of rest. The average length of these periods and consequently also the rate of growth is characteristic for each clone. OSTENDORF gives in his paper an interesting graph of the growth of the quick growing clone AV 50 and the slow growing clone Ct 88. An idea of the growth of these clones may be given in the following table.

TABLE IV. — *Growth of quick-growing and slow-growing clones compared.*

Length of time of the periods of growth and rest			Growth in centimetres in each period (x)			
			Clone AV 20	Clone Ct 88	Clone AV 20	Clone Ct 88
1st	Growth . . . . .		2 weeks	2 weeks	54 cm	45 cm
	Rest . . . . .		3 "	7 "	—	—
2nd	Growth . . . . .		3 1/2 "	3 1/2 "	55 cm	80 cm
	Rest . . . . .		2 "	5 1/2 "	—	—
3rd	Growth . . . . .		4 "	3 1/2 "	46 cm	68 cm
	Rest . . . . .		1 "	3 "	—	—
4th	Growth . . . . .		5 1/2 "	4 1/2 "	55 cm	72 cm
	Rest . . . . .		1 1/2 "	2 1/2 "	—	—
Total . . .			22 1/2 weeks	31 1/2 weeks	210 cm	284 cm

(2) These figures are only approximate as being deduced from the graph.

It thus appears that in the trees of clone AV 20 the periods of rest are shorter than in clone Ct. 88, so that the growth is much quicker. It is a well demonstrated fact that the success in oculation depends a great deal on the condition of growth of the stem from which the buds are taken: if the stem was in a growing condition the buds grow together with the stock more easily than if the stem was resting. It is thus clear that a quick growing clone like AV 20 in which the periods of rest are short, has more chance of yielding buds which are in suitable condition for budding than a clone like. Ct. 88 with long periods of rest.

A slow growth in length of the stem is not always followed by a slow growth in circumference. It may happen — as is the case for instance with clone Ct 88 — that the trees stop the slow longitudinal growth at a rather early date and begin to form a crown. With the formation of a crown the stem begins an intensive increase in circumference, and in this way the "slow growing" clone may sooner be tappable than the "quickly growing" one.

Many new data have been gathered about the production and the other characteristics of the clones (57, 58, 59, 60, 61, 62, 63, 64).

Yield figures for the most promising Java and South Sumatra clones from the experimental tappings of last year are shown in Table V, together with the yield figures of the two previous years. It must be borne in mind that these figures do not give more than an idea of what may be expected from the clones when planted on a large scale. More yield records and records of a greater number of trees will be necessary to allow of a definite conclusion on the value of the different clones. For the present the clones Bd. 5, Bd 5A, Tjir XIV, Pl. trots 2, Pl. trots 3, Pl. trots 5, Lampongiana 1, 2 and 3 and Waringiana 1 seem especially promising.

TABLE V. — *Production in kg. dry rubber per tree.*

(The tapping system was over  $1\frac{1}{3}$  of the circumference every other day).

Age in years at the beginning of the experimental year . . . .	5 to 5 $\frac{1}{2}$	6 to 6 $\frac{1}{2}$	7 to 7 $\frac{1}{2}$	8 to 8 $\frac{1}{2}$	9 to 9 $\frac{1}{2}$	10 to 10 $\frac{1}{2}$	11 to 11 $\frac{1}{2}$	12 to 12 $\frac{1}{2}$	13 to 13 $\frac{1}{2}$
Bd. 2 . . . . .	—	—	—	—	—	7,9	8,2	6,2	—
Bd. 5 . . . . .	—	—	—	—	—	11,5	11,8	13,2	—
Bd. 5 A . . . . .	—	—	—	—	—	—	—	10,8	—
Bd. 7 . . . . .	—	—	—	—	—	7,4	7,0	6,7	—
Bd 10 . . . . .	—	—	—	—	—	8,6	9,1	{ 8,8 } { 8,1 }	9,7
Bd. 16 . . . . .	—	—	—	—	—	7,0	7,4	7,5	—
Bd. 17 . . . . .	—	—	—	—	—	5,6	7,0	6,9	—
Tjir. XIV . . . . .	—	—	—	10,9	10,8	9,2	—	—	—
Pl. Trots 2 . . . . .	—	—	—	9,2	10,8	8,9	—	—	—
Pl. Trots 3 . . . . .	—	—	—	7,6	7,2	7,8	—	—	—
Pl. Trots 5 . . . . .	—	—	—	6,6	7,0	6,1	—	—	—
Pl. Trots 6 . . . . .	—	—	—	6,6	6,0	6,7	—	—	—
FR. 2 . . . . .	1,9	2,5	3,5	—	—	—	—	—	—
FR. 107 . . . . .	2,4	3,1	4,7	—	—	—	—	—	—
Limbung I . . . . .	—	—	3,0	6,3	7,7	—	—	—	—
Lampongiana 1 . . . . .	—	—	6,0	{ 6,5 } { 9,0 }	10,4	—	—	—	—
" 2 . . . . .	—	—	6,9	{ 9,2 } { 8,4 }	11,5	—	—	—	—
" 3 . . . . .	—	—	8,1	{ 7,6 } { 5,3 }	—	—	—	—	—
" 4 . . . . .	—	—	5,8	{ 6,0 }	7,1	—	—	—	—
Waringiana 1 . . . . .	—	—	—	—	—	7,3	9,1	—	14,2
" 2 . . . . .	—	—	—	—	—	—	8,4	8,5	9,5
" 3 . . . . .	—	—	—	—	—	7,1	7,2	8,6	10,7
" 4 . . . . .	—	—	—	—	—	—	—	9,2	14,1
" 5 . . . . .	—	—	—	—	—	—	—	10,4	11,6
Djasinga 1 . . . . .	—	—	—	4,8	5,0	6,8	—	—	—

When these figures are compared with those for the Java and Sumatra clones in Table XII of the former review (See this *Bulletin*, 1931, No. 7, p. 265 T) we find, that the clone BD 5 was in its 10th and 11th year the most productive of all the Java and Sumatra tested clones, but was surpassed in its 12th year by the clone Waringiana 4. It is furthermore apparent that a production of an average of 10 to 11 kg in trees of 9 years and older is no exception. What will be the yield of the different clones per hectare is not yet certain as the number of tapped trees is too small, and it will not be possible to form an opinion before regular plantations come into tapping.

How risky it is to estimate the value of a clone from the yield of a few individuals has become apparent after the investigation into the variability of the trees of one clone. This variability has been found to be much greater than was generally accepted (65). To give an example: in a field of 0.6 ha with 147 trees 11 years old of clone Djasinga 1, 21 trees gave in 1930 a yield between 2 and 5 kg dry rubber, 44 trees yielded between 5 and 7 kg, 56 trees between 7 and 10 kg, 23 trees between 10 and 15 kg and 3 trees between 15 and 18.7 kg. In order to thin out to such an extent that the average production would be increased to 9.6 kg per tree — which is to be considered a fair yield in this clone — it would be necessary to thin out 44 per cent of the trees and to leave only 137 trees per ha. This number, however, would be much too small, as for this clone with its small crown 275 trees of 11 years is considered the right number per hectare. In order to obtain such a number after thinning out 44 % of the trees, an initial number of about 500 trees per hectare would be necessary.

The general conclusion is, that on account of the great variation of yield in one clone, a larger initial number of trees must be planted than is generally done and it may be that the ideal number for many clones will be not much smaller than the ideal number for seedlings (500 to 600 trees per hectare).

The conclusion that the yield variations of the trees of one clone is rather great, was also reached by OSTENDORF (66). For 9 clones he calculated the coefficient of variability and found that this coefficient varied between 19 and 29; in older trees it will be about 20. A coefficient of 20 means that the majority (68 %) of the trees has a production between 80 and 120 % of the average, 14 % of the trees a production between 60 and 80 %, and 14 % a production between 120 % and 140 % of the average, the rest (4 %) has a production smaller than 60 % or higher than 140 % of the average. The great majority (96 %) of all the trees thus shows a production between 60 % and 140 % of the average and the most productive tree yields about  $2\frac{1}{3}$  times as much as the least productive. The conclusion is again that a rather large initial number of trees is advisable in order to be able to thin out thoroughly. The Rubber Experiment Station advises provisionally an initial number of 400 trees, but the ideal number will be different in different clones.

On the other hand the opinion has been stated (67) that the different trees vary much in different years and that in later years the differences in yield are sometimes less than in the earlier years. It will be necessary to collect more figures about the individual yield of young and of old trees to form a definite conclusion on this matter.

The correlation between yield and girth has already been the subject of several investigations, but these have all been carried out with a mixed materiel from unknown parent trees. VAN DER HOOP (68) investigated the matter in seedlings and in budgrafts of one mother tree. As could be anticipated, the correlation was much higher in the budgrafts than in the seedlings as the figures in Table VI show.

TABLE VI. — *Coefficient of correlation between yield and girth in budgrafts of one mother tree.*

Mother tree. . . . .	A	B	C
Seedlings . . . . .	0,480	0,602	0,408
Budgrafts . . . . .	0,790	0,847	0,805

The correlation ratio in other clones was partly about equally high, partly considerably lower than in the clones A, B and C. For the present no conclusion can be drawn as to what these differences can be ascribed.

Of the influence of stock on scion and *vice versa* our knowledge is still very incomplete. SUMMERS (69) considered it justifiable to draw from a rather small number of exact experiments the conclusion that the stock is able to influence the rate of growth of the budding but is unable to influence its production. But it may be considered questionable if even this conclusion is allowable.

On the other hand there are certainly facts which point in the direction that productivity of the stock is influenced by the scion. Figures about high placed budgrafts on a Sumatra estate (70) give new support to this suggestion. On this estate the stock of unselected seedlings grafted with buds of selected clones, gave a 25 % higher yield than selected seedlings. But the anatomical investigations seem to demonstrate that the problem of high-placed budgrafts is very complicated and that the influence of different clones on the stock differs; next to cases in which an increase in yield of the stock under the influence of the scion was found there were other cases in which an apparent decrease was found. BOBILIOFF investigated the number of latex vessels of stock and of scion in 10 clones; the figures which he found, though interesting, do not give any direct indications about the influence of stock on scion and *vice versa*.

Not less interesting but equally inconclusive as regards the influence of scion on stock are the experiments of VAN DER HOOP (71) in which the yield of high-placed budgrafts was compared with the yield of the stocks. The stocks were planted in 1919-1920 and 1921-22 and budded in 1923; they were tapped from 1928 to 1931. In the great majority of these budgrafts the stock gave a higher yield than the scion (in total the yield of the stocks was 115 % of that of the scions), but the result was only reached after one year tapping; in the first year (1928) the yield of the stocks amounted only to 90 % of that of the scion.

For the identification of the clones by morphological and other characteristics, see under " Botanical investigations " (this *Bulletin*, 1932, No. 5, p. 163-165).

Dr. C. J. J. VAN HALL.

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#### **Meeting of the Bureau of the Commission for Agriculture in Tropical and Sub-tropical Countries (International Scientific Agricultural Council).**

The Bureau of this Commission for Agriculture in tropical and sub-tropical countries met at the Institute on 16, 17, 18 and 19 May 1932, in pursuance of the recommendation made at the time of its previous meeting in November 1931 (see *Monthly Bulletin of Agricultural Science and Practice*, February 1932, pp. 45 to 53).

The following States and Colonies and Ministries were represented: Argentina, Belgium and Belgian Congo, Colombia, Egypt, Spain, Ministry of the French Colonies, French West Africa, Algeria, Indo-China, Madagascar, Morocco, Tunisia, Ministry of Foreign Affairs of France, Italian Ministry of the Colonies, the Italian Colonies, the Indian Empire, Netherlands and the Netherlands Indies, Portugal, Siam, Uruguay.

The agenda of the first meeting of this Bureau had dealt with technical questions, and that of this second meeting was devoted to economic questions.

#### **Agenda :**

1. Development of native agriculture. Methods: propaganda, instruction, collaboration between natives and settlers; creation of industries with reserved zones; agricultural credit.
2. Assistance to settlers' undertakings. Agricultural credit. Reduction of taxes. Lowering of transport rates and charges on exports and imports. Premiums.
3. Organisation of studies of native rural economy.
4. Bibliography of publications relating to agriculture of tropical and sub-tropical countries.

5. Distribution of communications on osteomalacia of cattle and examination of the measures to be taken.

6. Miscellaneous.

M. LOUIS-DOP was chairman of the meetings. The general report was presented by Prof. LEPLAE.

As the result of the discussions, the following conclusions were reached :

1. The Institute should address to the Governments a statement on regard to the great utility, in this period of agricultural crisis, of the study of the economic conditions of native agriculture, and indicate clearly the lines along which such a study could be organised. In addition, Governments carrying out any such enquiries should be invited to consider the practicability of communicating them to the Institute and of empowering the Institute to publish them. Steps should also be taken to prepare and to communicate to Governments programmes of studies of native economy which would be made more comprehensive and adapted to the special conditions of different tropical and sub-tropical regions of Africa and of the other continents.

(The above resolutions are the summary of a report presented by a sub-committee appointed for the purpose of preparing it and consisting of MM. LOUIS-DOP, VAN RIJN, KELLER, MAUGINT and LEPLAE).

2. The Commission confirms the opinion previously expressed in November 1931 as regards the great practical interest of the yearly publication of a bibliography organised in accordance with the suggestions of M. VAN HALL. The details of the preparation of this bibliography are to be arranged by the competent services of the Institute., in agreement with M. VAN HALL.

3. The Commission stresses the importance of the work done by Sir Arnold THEILER, his collaborators and his students, on deficiency diseases of cattle and sheep.

J. LEGROS.

## AGRICULTURAL ENGINEERING

### Miscellanea.

THE FIRST NATIONAL WEEK OF AGRICULTURAL MACHINERY, ROME, 8 MAY-5 JUNE 1932. — An Exhibition was organised to demonstrate to visitors the development of the farm machine industry in Italy. The exhibition was mainly national though foreign firms were allowed to show machines not yet well known in Italy.

Amongst the exhibits were particularly to be noted the electric machines for tillage with cable traction which Italy has made great efforts to introduce. Two different systems were represented, the one with 2 windlasses and the other with 1 windlass and an anchor ; the former are more widely used owing to their being easier to manipulate. There was also a new electric tractor, but its radius of action being limited by the length of the electric cable and the wear and tear of the latter, which would seem to be considerable in spite of the automatic winding and unwinding on a windlass attached to the tractor, will make competition with the motor tractor difficult.

The machines for use in the rice growing industry gave a special character to the Exhibition, more particularly the automatic and semi-automatic transplanters, the development of which has been promoted by international competitions at the Experimental Rice Growing Station at Vercelli of recent years. The problem of transplanting rice by machine does not however seem to have been finally solved. The plant for drying, treating and grading rice showed the importance of the crop for northern Italy.

A still more important crop in Italian agriculture is the olive, so that mechanical oil presses have long been experimented with in the country. The latest research is tending to replace the coconut fibre strainers previously used by perforated iron rings. The encouraging results obtained with this new system have led to the industrial con-

struction of new types of presses ; their yield however has not yet reached that of the old type, though their great advantage is that they are easily cleaned and less perishable.

Italian makers have made great efforts to produce tractors. The Fiat and Pavesi are the most perfected. The Fiat company exhibited the first caterpillar-wheeled tractor of Italian construction, with a h.p. of 28-30. The power at the belt pulley of this tractor is 22 h.p. Naphtha or petrol is used as fuel. The 'Motomeccanica' Co. Ltd. of Milan which builds the 'Pavesi' tractor with 4 driving wheels and independent suspension of the front wheels, showed its new small 'Balilla' tractor, which has all the characteristics of the ordinary tractor on a small scale. This small tractor can replace the work of 3 horses and gives a power of about 10 h.p. at the pulley. In consequence of its duplex gearing it can go at 6 forward speeds and 2 in reverse. It is run on petrol.

Among the machine ploughs was to be noted a small Fiat plough in which the plough is in front of the engine, and a reversible plough in which the share is worked by the driving wheel on the right. At the end of the furrow there is no need to turn the engine but only to reverse the balance plough arrangement.

The centre of the Exhibition was occupied by a large building containing models and photographs of large and small Italian land development installations ('bonifica integrale'). These were mainly pumping plant terminating canal systems for draining regions of northern Italy which are partly below sea level. Round this building were a number of other pumping and spray irrigation installations.

Foreign exhibits were, as has been said, relatively few. A Russian firm showed various farm machines, a French firm some maize shellers and other countries with representatives in Italy showed more or less well known machines.

During the Exhibition trials were made of the machines in the experiment fields of the Agricultural Engineering College at Capannelle near Rome, the Director of which, Prof. A. MICHELI, organised the technical part of the Exhibition.

From 12 to 14 May was held the first National Congress of Agricultural Engineering which dealt with various questions of special interest in Italy. A number of the reports were concerned with the use of electricity in agriculture. A proposal for a central commission for electrification of agricultural land was accepted by the Congress. Other proposals aiming at forming a syndicate of Italian farm machine makers and instituting a central organisation for directing research in agricultural engineering were not adopted. A particularly interesting report was that of Prof. SANTINI on the estimation of the efficiency of tractors by their grip of the ground.

The visitors to the Exhibition numbered 700,000 and the firms exhibiting about 620.

H. J. H.

## BOOK NOTICES \*

### Miscellaneous.

*Index bibliographicus*, Catalogue international des bibliographies courantes, 2<sup>ème</sup> édition mise à jour et considérablement augmentée, publiée par M. GODET et J. VORSTRUS, 430 p., Berlin, de Gruyter, 1931 (en tête : Société des Nations, Institut International de coopération intellectuelle à Paris).

[The purpose of this Index, which is based on material supplied by the Berlin State Library in collaboration with the national libraries of 37 countries, is the compilation of a methodical and descriptive list of all the bibliographies appearing periodically, either in the form of bibliographies properly so-called or in the form of reviews of a more general character which contain a bibliographical section. The work includes not merely bibliographical particulars but also analytical and critical notes. As in the first edition which appeared in 1925, the French edition of the Decimal Classification (1927-1929) has been followed in the classification of the titles.

In the agricultural section a considerable increase in the number of titles is to be noted (new edition : 70 ; 1925 edition : 27), so that now agriculture may be considered to be adequately represented. Amongst the 70 agricultural bibliographical reviews

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\* Under this heading are included short synopses of books received for review.

12 languages are represented, namely: — German, English, Danish, Spanish, French, Dutch, Italian, Lithuanian, Russian, Serbo-Croatian, Swedish and Czech. The greater number of the reviews cited deal with agriculture in general, but those concerned with a particular branch such as agricultural chemistry, plant pathology, forestry, horticulture, stockbreeding, dairying, are not neglected].

S. v. F.

*A Catalogue of British Scientific and Technical Books*, third edition, compiled by Daphne SHAW. 754 p., London 1930, A. and F. Denny, Ltd.

[The new edition of this bibliography of the most important scientific works published in Great Britain has been compiled under the auspices of the British Science Guild and contains about 14 000 titles, that is to say more than double the number included in the 1st edition published in 1921.

The word 'science' is interpreted in a wide sense. The biological, physical and technical sciences are all particularly represented, but the social sciences and philosophy are by no means neglected. Agriculture, horticulture and forestry are given 35 pages containing about 770 well selected titles. A list of publishers and excellent subject and author indices greatly enhance the utility of the catalogue].

S. v. F.

### Botany.

LEHMANN E. und AICHELE F., *Keimungsphysiologie der Gräser (Gramineen)*, XXIII + 678 p., 152 Abbildungen, Stuttgart 1931, Verlag von F. Enke.

[The study of the germination of seeds has made great progress of recent years. It has been stimulated by practical needs and more particularly by the necessity of seed control. Recently as a result of the valued work of M. FRANK (Wageningen) an international bibliography of seed control has been compiled regularly. The International Association for Seed Control has on the initiative of its eminent President, M. Dorph-Petersen (Copenhagen), started a special periodical, the *Mitteilungen der Internationalen Vereinigung für Samenkontrolle*, publishing information on the subject. But hitherto there has been a lack of any treatise summarising the results of recent research for the use of the farmer and the scientist. The publication of this work on the Physiology of Germination in the Gramineae fills the gap.

The work has happily been limited to a study of germination in this one family, which incidentally is the most important as regards human food, and so has avoided trying to cover too vast and complex a subject. The collaboration of a botanist and a chemist has enabled the writers to cover a wide field and they have been indefatigable in collecting material from all sources, often not readily accessible. Further M. LEHMANN has been able to draw upon his own numerous and valuable works on the subject, with the result that the chapters dealing with his special field of study are particularly competent and contain details previously unknown. The chapters on the influence of light and temperature on germination are specially noteworthy. To M. AICHELE is due a clear account of the chemical constitution of seeds and the physico-chemical changes accompanying germination. The part dealing with permeability, the swelling of the integument and the process of delayed maturation is treated in a new and particularly striking manner. The grower will be particularly interested in the chapters on seed storage, disinfection and stimulation.

The questions of the physiology of germination which concern the fermentation industries and more particularly brewing are also dealt with at length.

Nor must the long chapter on the methods used in seed control be left unmentioned.

In each chapter the subject is first treated from a general and theoretical standpoint and then the various species of Gramineae are discussed in detail. After describing the morphology, anatomy and chemical composition of Gramineaceous seeds the writers pass to chemico-physiological questions. Germination capacity and the resting period, the phenomena occurring during germination, etc. are considered with all the secondary problems such as vitality, respiration, influence of internal and external factors, germination metabolism, etc.

The bibliographical references, occupying 75 pages, show the immense task accomplished in the compilation of the book and the manner in which the material has been dealt with makes it a work which will be of the utmost value to science and to the farmer].

N. v. G.

BARONI Dr. Eugenio, *Guida botanica d'Italia a chiavi analitiche*, Seconda edizione, XXXI + 359 p., 360 fig., Bologna 1932, L. Cappelli editore.

[The Flora of Italy published by ARCANGELI in 1894 having been out of print for some years a new handy flora was much needed. A second edition of the *Guida botanica d'Italia*, enlarged to include the whole of the country instead of only Central Italy as in the first edition, is therefore very welcome. There is thus available a new analytical flora with artificial keys making it possible to determine readily any species growing wild in Italy].

N. v. G.

TREVISAN Luciano, *Piante grasse*. Milano 1932, Ulrico Hoepli editore.

[This book of 308 pages with 106 plates contains a description and classification of the succulent plants and more particularly the Cactaceae with information about their cultivation. After describing the general morphology of the cactus family the writer passes to details of fertilisers, planting, summer and winter treatment, propagation, grafting and seeding, diseases and pests. Then 132 pages are devoted to a detailed description of the various genera and species together with notes on their cultivation. The succulents not belonging to the Cactaceae are then similarly treated. The book is completed by a table showing the cultural rules for all the species described, which are suited for indoor pot cultivation].

D. K.

### Stock Breeding.

ENGELER W., *Die männlichen Erblinien der schweizerischen Braunviehzucht*, 267 p., 114 Fig., 105 Ahnen- und Nachzuchtafeln. Verlag Huber & Co., A. G., Frauenfeld und Leipzig, 1932.

[This work on the lines of male breeding stock of the Swiss brown cattle is based on data drawn from published and unpublished sources and is developed on modern lines. The facts allow of an objective estimation of the value of the most important bulls and their progeny, taking into account their yielding capacities.

Detailed descriptions, photographs and pedigrees make the text lucid and interesting for the farmer as for the geneticist in Switzerland and elsewhere].

## FORESTRY

### Notices.

FORESTS AND THE TIMBER INDUSTRY IN FINLAND. — Among the countries in civilised Europe in which forestry is important, Finland has the largest afforested area with the exception of Russia. In Sweden the area under forest is 23,185 million ha. while that of Finland is 25,265 million ha.; on the other hand, as regards the amount of timber and woody increment the figures for Sweden are the higher, the amount of timber in Sweden being 1,417 million cubic metres and that of Finland 1,317 cubic metres only, and the woody increment in Sweden amounting to 47.7 million and that of Finland only to 44.4 million cubic metres.

The manufacture and conversion of forest products in Finland have reached a high state of development largely on account of its valuable resources in water power and more than half the industrial workers in the country are engaged in this industry. Even though the lumber floating system is not everywhere completely satisfactory it may be said, taken as a whole, to be adequate as a means of transport. One seaport, at least, is kept free from ice throughout the winter when freight charges for paper pulp and paper are at their lowest and this is a very important factor in securing continuity for the export trade and for the general economic well being of the country.

The effect of the heavy exports of forest products from Finland is strongly felt on the Swedish markets but the trade competition between the two countries has always proceeded on fair lines and there is even a certain degree of collaboration in regard to matters of common interest, which is a very valuable element during the present time of crisis.

The following table shows the extent of the export trade in soft woods, including paper pulp and paper, of Sweden and of Finland respectively, during the last three years :—

Year	Sawn Timber		Logs and squared timber		Paper pulp		Paper, cardboard	
	Sweden	Finland	Sweden	Finland	Sweden	Finland	Sweden	Finland
	1,000 standards (1)		1,000 m <sup>3</sup>		1,000 tons		1,000 tons	
1929 . . . . .	1 123	1 101	1 474	3 124	1 789	645	480	206
1930 . . . . .	928	824	1 028	2 667	1 632	633	436	307
1931 . . . . .	701	737	574	1 630	1 561	787	479	324

(1) 1 standard of sawn timber = 4.672 m<sup>3</sup>

Among the other exported timber products of Finland plywood is the most important and Finland is the greatest world exporter of cotton-reels.

This country is fully aware of the important place of its forests in its economic life and has taken all necessary steps to secure continuous production. In 1917 a new system of forestry legislation came into force, which contains regulations relating to the duty of re-forestation and prohibits any other form of felling in young forests except such as is required for thinning purposes. Since 1929 the new legislation, which originally referred to conifers only, has now been extended to broad-leaved trees. Forestry councils have been appointed to the various provinces to secure the due observance of the laws, and at the same time they supply advice and instruction and are responsible for forestry propaganda. Considerable financial assistance has been given to private owners, chiefly in the form of loans.

The estimates made by the Government in 1927 regarding the relation between fellings and woody increment show that fellings have amounted to 52.2 million and woody increment to 44.4 million cubic metres, in both cases bark not included.

It is generally considered that the recent reduction in felling due to the crisis has tended to bring about a diminution in the over-exploitation of certain forest areas.

In any case the crisis has caused a heavy falling-off in the prices obtainable for forest products and, as shown by the table given above, there has been a marked reduction in the exports of sawn timber and logs during 1930-31, whereas the exports of paper pulp and paper have been well maintained.

Under the pressure of Russian competition the timber industry in Finland was obliged in the summer of 1931 to sell at prices lower than those charged for Russian timber, the result being that the amount of sawn timbers which Russia was expected to export to England has fallen from 600,000 to 500,000 standards. Hence Sweden also, as well as Russia, has been obliged to lower prices so that during the autumn of 1931 timber quotations were only slightly higher than those of the pre-war period. In reply to the question how it was possible for Finland to undersell Russia it is stated : (1) that the forests in Finland are as a rule far better situated than those of Russia from the point of view of transport ; (2) that the timber industry in Finland is greatly superior to that of Russia both from the point of view of organisation and management and of the workers' efficiency. It is clear that this lowering of prices must have its effects not only on the returns to the shareholders in timber companies but also on the prices of standing timber and upon wages.

(The above notes are based on a report by M. Thorsten STREYFFERT published in *Skogsvännen*, Stockholm, 1932, I).

R. W.

THE ORGANISATION OF FORESTRY RESEARCH IN FINLAND. — The Helsinki Forestry Research Station has from the beginning worked on the lines of an independent institution for scientific experiment and its foundation deed provides that the Professors employed at the Station should make their experiments in accordance with their own schemes of work. In addition to the practically complete independence and liberty enjoyed by the professional staff their assistants are also allowed a considerable amount of freedom in planning their researches.

The present staff is responsible for carrying out scientific and practical experiments under the following main divisions: (1) general forestry; (2) forest valuations and estimates; (3) forest soils; (4) drainage of marshlands (a matter of special importance in Finland); (5) forestry economics and statistics; (6) forestry science and technology.

From its earliest days the Research Station has enjoyed the right to carry out its experiments in all the forests belonging to the State and recently 15 experiment areas have been assigned to it. These are situated in different parts of the country and are representative of all the differences of climate and soils; their total area is nearly 250,000 acres.

The Experiment Station was at first under the orders of the State Forestry Department in accordance with the terms of a law of 1931 but it is now quite independent and reports directly to the Ministry of Agriculture.

The Forestry Department in the Helsinki University also carries out forestry research work and has its own special trial grounds, covering a total area of upwards of 40,000 acres, these being mainly used for instruction and practical work by the students. Although the Forestry Research Station and the Higher School of Forestry are separately organised, a close collaboration is constantly maintained between the two institutions.

Reference may also be made to the Finnish Forestry Science Association which was founded in 1909 and also performs very valuable services. Its membership is limited to forest officers and to scientists and technicians specialising in various forms of scientific experiment work related to silviculture. The Society offers premiums and other forms of assistance for experimental work in forestry and publishes reports on the results obtained.

It should further be stated that there is close co-operation between the three institutions above mentioned, and the State Forestry Department as also with the Union for the Extension of Scientific Timber Research. The last-named society was founded in 1929 and receives a generous grant from the State.

(The above information is based on an article by A. K. CAJANDER: Die organisation der forstwissenschaftlichen Forschungsarbeit in Finnland, published in *Silva Fennica*, Helsinki, 1931, No. 20).

G. I.

**THINNING EXPERIMENTS IN YOUNG DOUGLAS FIR IN THE UNITED STATES.** — In 1919-20 a thinning experiment was initiated in a 9 year old stand of Douglas fir *Pseudotsuga Taxifolia* at the Wind River Forest Experiment Station, Stabler, Washington. The experiment took place on 3 plots measuring respectively 0.79, 0.76 and 0.75 acres and the object was to determine the effects of thinning upon dense seedling and sapling stands of Douglas fir and to discover the best methods of carrying out the thinning process.

In 1924-25 the second measurements were taken on these three plots, two of them having been thinned and measured in 1919-20, and the third measurements were taken in 1929. On Plot I the trees were thinned to as near an 8 x 8 foot spacing as possible and, as position rather than the characteristics of the seedlings were the chief consideration, there were in the resulting stands dominant, intermediate and suppressed trees. Plot II was established as a check plot and Plot III was thinned to an approximate 8 x 8 foot spacing but only the dominant trees were left.

At the end of the observation period it was noted that, of the three plots, Plot III, with dominants only, has the best appearance, the trees being bigger and having wider and healthier crowns. In the length of crown however, and in the thickness of the branches, the thinned plots appear at a disadvantage to the checked plot where the trees are so closely spaced that natural pruning has already begun and none of the branches are very heavy, whereas, on both the thinned plots the branches extend to the ground. Hence to a certain extent the improvement in growth will be offset in the future by the poorer quality of the wood produced. Since the thinned plots have not as yet reached the stage when the crowns are closing in, there will be still further unfavourable development of the limbs.

The author's conclusions are as follows: Thinning in small stands of Douglas fir has had a favourable effect on the growth of the trees and it seems probable that this effect will last for some time; a precise spacing in thinning such stands is much less desirable than an approximate spacing in which dominant saplings are left; thinning has no determinable effect upon height growth but it has a decided effect upon dia-

meter growth over and above the effect of automatically raising the average diameter if the proper trees are left; trees in the same initial diameter class do not remain long in the same class but in a very short period cover a wide range of diameters; average trees of the first measurement did not remain average trees in later measurements but seemed to gain and to grow larger than the average: the distribution of the larger sized trees is far the best on the plot containing dominants only; the thinned stands look much healthier and stockier than the unthinned stand.

Against the advantages of thinning may be placed the disadvantages of increased limb development which continues until the crowns close in, when the limbs will probably be so heavy that natural pruning will be greatly hindered.

(Based on an article by W. H. MEYER in the *Journal of Agricultural Research*, Washington D. C., 1931, No. 6).

R. W.

INTERNATIONAL ASSOCIATION OF WOOD ANATOMISTS. — In accordance with the provisional arrangements made at Cambridge in 1930 on the occasion of the International Botanical Congress, a Meeting of the members of the Organising Committee formed with the object of establishing an International Association of Wood Anatomists took place in Paris during « Le Congrès International du Bois et de la Sylviculture » in July 1931. This Committee presented a draft form of constitution for the Association to a Meeting held under the presidency of Professor Guinier, attended by 25 persons representing Belgium, France, Germany, Great Britain, Holland, the Philippine Islands and Spain. The draft constitution was unanimously approved and the Association was thus founded, the executive power being left in the hands of the organising committee until such time as the Council should be appointed.

The object for which the Association is founded is the advancement of the knowledge of wood anatomy in all its aspects and, with this end in view, it will make every effort to: (1) interchange ideas and information through correspondence and meetings; (2) facilitate the collection and exchange of material; (3) work towards standard terminology and descriptions; (4) encourage the publication of scientific articles and abstracts; (5) foster and assist the study and teaching of wood anatomy; (6) engage in any other activity consistent with the objects of the Association.

The Association is of a purely technical and professional character and its business will mainly be carried out by correspondence and without any large number of meetings though an endeavour will be made to hold meetings when suitable opportunities arise. The Secretary is Mr. Samuel J. RECORD, Professor of Forest Products at Yale University and Editor of the Review "*Tropical Woods*" published by the Forestry School of the University. The September 1931 issue of this review (No. 27) contains the information upon which this note is based.

R. W.

THE INTERNATIONAL UNION OF FORESTRY RESEARCH STATIONS has recently published its Report for 1931 which is reviewed in "*Skogen*", (Stockholm, 1932, No. 4), the writer of the Review stating that, despite all the difficulties caused by the world crisis to the various international associations, the Union has displayed remarkable vitality. During 1931 no less than 32 new Forestry Research Stations and Higher Schools became members of the Union, which now has a membership of 85 Institutions representing 31 countries, including 19 in the United States, 13 in the British Empire and 10 in Germany, other countries being represented by from 1 to 3 associations or teaching institutions in each case.

The work of the general secretariat, which began in 1929 with the special object of establishing a form of international agency for obtaining forest seeds of guaranteed origin, seems to meet a long felt want. Although the last few years have not been particularly productive it has generally been found possible to meet the requirements of members. The Annual Report now contains a list of a dozen institutions in different countries from which seeds may be ordered; it is, however, stated that this list must be regarded as at present incomplete, since correspondence has been initiated with a number of other countries with which, however, definite arrangements have not yet been concluded.

During 1931 the *International Union of Forestry Research Stations* has been included in the list of international associations prepared by the League of Nations, and during September of the present year the International Congress of the Union will take place



at Nancy (France). The draft programme for the Meeting has already been published in the first number of the *Monthly Bulletin of Agricultural Science and Practice*, for the current year. (see p. 30).

R. W.

INTERNATIONAL CONGRESS OF GAS-CHARCOAL, MILAN, 1-7 OCTOBER 1932. — The object of this Congress is the consideration of all questions relating to the utilisation of charcoal as a subsidiary carburant.

The Congress will be arranged in four sections dealing with the following aspects of the main subject:—

- (1) the study of charcoal as a carburant from the scientific, technical and economic standpoints;
- (2) methods of industrial production;
- (3) methods of utilisation and distribution;
- (4) use of gas-charcoal in colonial possessions.

The following have the right to take part in the Congress: (1) the official delegates of the nations represented and of the Italian Government; (2) the members of the Permanent International Committee for Gas Charcoal; (3) the delegates of institutions, scientific societies, higher schools, associations or institutes officially recognised in Italy or in each of the nations represented.

Any other person can take part in the work of the Congress on condition that: (a) a written request for admission is sent *before 1 September 1932*, addressed to the Secretariat of the Organising Committee and indicating clearly the name, address, nationality, profession and qualifications of the applicant; (b) the application is accepted by the organising Committee of which the address is c/o the Italian Touring Club, Corso d'Italia 10, Milan.

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# PLANT PROTECTION



# INTERNATIONAL BULLETIN

## OF PLANT PROTECTION

1932

No. 1.

### DISCOVERIES AND CURRENT EVENTS \*

#### North Africa : Desert Locusts (*Schistocerca gregaria*) (1).

Swarms reported during November 1931 :—

Numbers of large swarms from 18 October to 5 November over the valley of Igharghar, between Tifdest and Amguid, flying from south-east to north-east.

On 1 November a small swarm over the palm plantation of Djanet, flying from south to north.

On the 4th a large swarm over Kadoussa on the Algeria-Morocco frontier, flew north-east.

On the 5th a swarm over Tisgui Ida ou Balloul (36 km south of Igherm, Morocco).

On the 9th a swarm at Tazzoughourt (20 km west-north-west of Bou-Denib) flying west.

On the 12th a small swarm alighted at Chellala des Adaouras (Mixed Commune of Sidi-Aïssa).

On the 16th a large swarm coming from the frontier passed over Foun El Kaous N'Tazoult (Circle of Ouarzagat, Morocco) flying west.

On the 19th a swarm was reported over the post of Flatters coming from the south-west.

On the 19th a large swarm coming from Foun Meskaou followed up the Oued Aqqa and passed Tisgui Ida or Balloul (36 km south of Igherm). A large part flew towards Igounan (72 km south-west of Igherm). The rest alighted at Ahl Tizzert (30 km south of Igherm).

On the 22nd a smaller swarm, 3 km by 1.5, alighted in the division of Ain Sem-mug des Sektana (85 km east of Taroudant).

On the 22nd a large swarm alighted at Ahl Aglou, Oued Massa, Chtouka from the west and remained there. On the 24th it flew away and passed over Tiznit in a south-easterly direction.

On the 23rd a very dense swarm alighted in the dunes 10 km south-west of Agadir.

On the 24th swarms passed 3 km south of Immouzer in the tribe of Ida ou Tanant (35 km east-north-east of Immouzer).

On the 25th a large swarm reported the day before over Tiznit alighted at Ouled Djerar (25 km south of Tiznit).

A swarm 8 km in length on the 25th and 27th flew over Tirjou, Bigoudine, coming from the south and alighted 35 km east-north-east of Immouzer.

Another swarm 8 by 4 km alighted on the 28th in the tribe of Ida ou Tanant.

\* In this, as in the next two chapters the countries are arranged in French alphabetical order  
(1) Communication from the Direction of the Economic Services (1st Bureau - Agriculture), General Government of Algeria, Algiers.

**Egypt: The Onion White Rot Disease (1).**

In February 1929, the Mycological Division of the Ministry of Agriculture, Egypt, received a specimen of diseased onions from Beni-Mazar in Lower Egypt. On examination this specimen has found to be infected with the 'White Rot Disease' caused by *Sclerotium cepivorum*. Consequently a thorough survey was made in order to find out the extent of the distribution of this disease in Upper Egypt specially in Beni-Suef, Girga, Minia and Quena Provinces. The disease was, however, present in a part of the Minia Province where 1238 feddans were inspected, of which only 113 feddans were found infected, and all of these were scattered in the two districts of Maghagha and Beni Mazar. The actual diseased area among these 113 feddans only amounted to approximately 8 feddans. In other words, the infected area in Upper Egypt only amounted to 0.5 % of the onion growing area, and the actually diseased area to 0.04 % of the onion growing area of Upper Egypt or 0.02 % of the total onion growing area of the whole of Egypt.

In April 1931 a careful watch was kept for any diseased onions arriving at the port of Alexandria for export. Onions were inspected at the Railway Station and the merchants' yard, but especial care was devoted to the onions as they passed through the grading machines. Although a very great quantity of onions were inspected carefully in this way no case of the 'White Rot' was found.

It therefore appears that the disease is at present confined to a very small area in Upper Egypt and that it does not find its way into the export crop.

A poster giving an illustration of the disease and advice to the cultivators as to how to avoid its spread is in course of preparation.

A full account of the disease, its distribution in Egypt and control measures to be taken, has been prepared and will shortly be issued in Bulletin No. 107.

**Eritrea: Locusts (*Locusta migratorioides* and *Schistocerca gregaria*) (2).**

On 3 and 4 November 1931 two swarms of desert locust, *Schistocerca gregaria*, were reported in the western plain in the territories of Agordat and Barentù.

On the upland plateau swarms of *Locusta migratorioides* from the Tigrai penetrated into Eritrean territory early in the month. After passing over the Seraë, Accchelè Guzai and Hamasien they flew in the direction of the eastern plain.

Numbers of swarms were also reported along the Red Sea coast. On 4 and 6 November desert locusts from the Agambussa crossed the plain of the Damas flying north-west.

On 7 November some locusts of unspecified colour and species alighted on Mount Debremahar, east of Salamona.

On 6, 7 and 8 November swarms flying in a northerly direction were observed at Salamona, along the Lebca stream and at Mersa Gulbub.

On 13 November a large swarm coming from the Agamè across the Abyssinian frontier alighted in the districts of Degghien, Uogherà, Lalai Agruf and Senafè; on 14 November it passed over Adi Caièh.

On 15 November numerous locusts damaged certain fields of 'bultuc' at Mersa Teclai and next day took flight again in the direction of the sea. On 16th

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(1) Communication from the official correspondent of the Institute, Mr. E. BALLARD, Chief Plant Pathologist, Plant Protection Section, Ministry of Agriculture, Giza, Egypt.

(2) Communication from the official correspondent of the Institute, Dr. A. DE BENEDICTIS, Chief of the Agricultural Office of Eritrea, transmitted by the Government of the Colony.

locusts were observed at Carora coming from the Anglo-Egyptian Sudan and flying south-west.

In the first decade of the month small groups of desert locust laid eggs in fields near Zenabzera (Uschiro); the eggs were immediately collected and destroyed by natives.

Hoppers were not reported in any territory of the Colony.

It should be noted that during November last year a large part of the swarms were still moving about the upland plateau and only small groups had reached the eastern plain. The locusts that are there will remain until they reach sexual maturity, when copulation will take place and eggs will be laid which will produce the spring generation.

#### United States of America : The Spread of Some Introduced Diseases of Trees (1).

The chestnut blight has, of course, reached the limit of commercial range of the chestnut. Occasionally, however, new infections are found on more or less isolated trees or in nurseries. Recently the disease has been found in native trees in Indiana and Kentucky.

The white pine blister rust has been found on *Rubus* species in Maryland, Virginia, West Virginia and Ohio. Immature rust cankers on pines have also been found in Maryland and Iowa.

Following the discovery of the Dutch elm disease in Ohio in 1930, intensive search was made in Ohio during the summer of 1931, and, as a result of the general interest in this disease, a large number of specimens from other States were sent in for identification, not only by State and Federal Pathologists but by amateurs. Only 4 additional trees, all in Cleveland, Ohio, were found infected with the Dutch elm disease, but the examination of material in the search for it brought to light a hitherto undescribed disease of elms. This disease, the symptoms of which somewhat resemble those of the Dutch elm disease, is caused by a quite different fungus the specific name of which has not yet been determined.

#### United States of America: The Distribution of Strawberry Dwarf caused by *Aphelenchus fragariae* (1).

The question of the distribution of strawberry dwarf caused by *Aphelenchus fragariae* has been recently given a degree of attention out of proportion to the commercial importance of the disease. The disease has long been common in the southeastern states from North Carolina to Louisiana. It was first definitely reported in 1905 in South Carolina. In the spring of 1930, a number of plants of a susceptible variety, many of which bore the disease, are known to have been shipped to various growers in the northern states outside the previously known range of the disease. Advantage was taken of this to determine the probable spread of the disease. In a survey made during 1930 and 1931, careful inspection was made of plantings where strawberries from the infected region had been established with the following results.

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(1) Communication from the official correspondent of the Institute, Dr. Neil E. STEVENS, Senior Pathologist, Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington.

The disease apparently failed to develop even on the recently imported plants in New Jersey, New York, Ohio, Kentucky, Indiana, Michigan, Minnesota, as well as northern Illinois and northern Pennsylvania. The disease was found to have persisted in introduced plants but not to have spread to other varieties in Maryland, Delaware, southern Pennsylvania and southern Illinois. In eastern Massachusetts the causal nematode was found both in the recently imported plants and in a few plants of a variety long grown in the states, but they apparently caused no disease symptoms.

#### Finland: Mites of the Hazel (1).

In the course of a study of the mites attacking hazels (*Corylus Avellana* L.) it has been found that all the species previously described as injurious to the hazel (*Eriophyes avellanae* Nal., *E. verniformis* Nal., *Phyllocoptes comatus* Nal., *Oxypleurites depressus* Nal., *Anthocoptes loricatus* Nal.) occur in Finland.

A species not previously described, *Phyllocoptes coryli* Liro, has also been discovered. This species hibernates like the others in the buds of the host plant, but causes also malformations in the male flowers. These malformations, although occurring frequently in Europe (Finland, Germany, Austria, England, France, Italy, etc.) have hitherto been attributed to *Eriophyes avellanae*.

The species of *Phyllocoptes*, *Oxypleurites* and *Anthocoptes* living on the exterior of the host plant have been accused of producing a brown coloration of the attacked leaves. But it would appear that all these species, and *Phyllocoptes comatus* in particular, are so common that they must be found also on the browned leaves if for any reason they are examined.

#### Latvia: Plant Diseases Observed in 1931 (2).

Field crops. — In the spring of 1931 a wilt of rye seedling plants was observed, caused by *Fusarium nivale*, which rendered necessary the re-sowing of a great part of the rye crop. Rye was also attacked by brown leaf rust (*Puccinia dispersa*) and black rust (*P. graminis*) and produced a poor crop. The black rust made its appearance on rye and other hosts particularly in districts where the barley has not yet been eradicated. In certain regions (Sigulda, Jelgava) there have been complaints concerning local epidemics of *Erysiphe graminis* on spring barley. The barley was also attacked more than in the preceding year by dwarf rust (*P. simplex*). Crown rust (*P. coronifera*) was observed on oats everywhere and in parts where *Rhamnus cathartica* is widespread even caused breaking of the straw.

Potato disease (*Phytophthora infestans*) was more or less serious.

Tree fruits and vegetables. — Certain nursery plantations are seriously infected by *Pseudomonas tumefaciens*.

*Cronartium ribicola* caused serious losses of black currants.

Tomatoes have been attacked by several fungus diseases. *Cladosporium fulvum*, which had previously been observed only under glass, spread into the fields. *Septoria Lycopersici* has frequently caused serious damage. *Botrytis cinerea* has caused injury to the fruits and fruit stalks under glass.

(1) Communication from the official correspondent of the Institute, Prof. J. Ivar LIRO, Director of the Plant Diseases Section of the Agricultural Experiment Institute, Helsinki.

(2) Communication from the official correspondent of the Institute, Prof. M. EGLITS, Director of the Phytopathological Laboratory of the University, Riga.

Lettuces were seriously attacked by *Bremia Lactucae* under glass.

Cucumbers in frames and in the open were badly damaged by *Colletotrichum lagenarium*.

**Ornamental plants.** — The following fungi attacking ornamental plants have been observed for the first time in Latvia: — *Puccinia Chrysanthemi* on *Chrysanthemum* sp. under frames and in the open; *Phyllosticta quinquefoliae* on *Ampelopsis quinquefolia*; *Hendersonia maculans* on *Camellia* sp. under glass; *Septoria Drummondii* on *Phlox Drummondii* in gardens.

### **Persia: Insect Pests (1).**

*Icerya purchasi* has for some years caused serious damage to the citrus trees in the Caspian Provinces; it also attacks other plants such as the pomegranate, fig, etc. and even certain wild plants. This scale has apparently no marked preference for citrus trees. The Insectarium of Antibes, France, has been requested to send several colonies of *Novius cardinalis* for acclimatisation in the infested regions.

*Parlatoria zizyphi* and *Chrysomphalus minor* have been observed in the same Provinces. Control by means of lime-sulphur sprays has been undertaken.

*Eurygaster integriceps* has caused serious losses in the Veramine region. In certain districts the damage has reached 90 %, and an average loss of 40 to 45 % is reported.

Early in the spring stock has been put in to graze the crops in the most seriously infested regions, the collection of adults was then begun and over a hundred tons were collected and burnt. Since the beginning of October collecting and burning has also been started in the mountains of Gara-agatche to prevent hibernation.

Amongst the eggs of *Eurygaster* collected at Veramine and sent for hatching in the Entomological Laboratory of the Keredj Agricultural College, certain were parasitised and a *Telenomus*, not yet identified, has emerged.

### **Aegean Islands: Crop Pests (2).**

During September, October and November 1931 large invasions of Tingitidae were reported on pear, apple and quince trees and on poplars.

In the west coastal zone of the island of Rhodes many garden crops were considerably damaged by caterpillars of Pieridae.

Fruit fly damage to citrus orchards in Rhodes and Cos is beginning to be apparent.

### **Switzerland: Potato Wart Disease (3).**

Potato wart disease (*Synchytrium endobioticum*), which was introduced into Switzerland for the first time in 1925, made its appearance sporadically during the following years. All the thirteen centres of the disease discovered between 1926

(1) Communication from the official correspondent of the Institute, Mr. Ahmed H. ADLE, Director of the Agricultural College, Keredj, Persia.

(2) Communication from the official correspondent of the Institute, Dr. Francesco DESSY, Director of Agriculture and Forests, Government of the Aegean Islands, Rhodes.

(3) Communication from the official correspondent of the Institute, Dr. E. NEUWEILER, Schweizerische Landwirtschaftliche Versuchsanstalt, Oerlikon-Zürich.

and 1930, which resulted partly from the original introduction and partly from soil infection, were destroyed by confiscating and boiling the potato crop, by disinfecting storage premises and implements and by putting the infected fields down to grass for ten years.

In 1931 the disease was again introduced in large imports from East Prussia of seed potatoes of the 'Alma' variety, hitherto believed immune from wart disease. An enquiry showed that there were outbreaks of the disease in 51 communes belonging to 8 different Cantons. Three further centres of infection have been found in two other Cantons on the varieties 'Alma', 'Frühe Rosen' and 'Kaiserkrone'. Two of these were caused by a new importation of seed potatoes, and the third by soil infection. These centres also will be suppressed by severe measures, so that there is no reason to fear the disease becoming more widely spread. One of the measures consists in the use of potato varieties which are resistant to wart disease. The new introduction of the disease in 1931 will assist in accelerating the application of such a measure.

#### **Tasmania : Clover Springtail (*Sminthurus viridis*) Field Control (1).**

Spraying isolated clover and grass pastures 3 times at intervals of 10 days with 1-60 Lime Sulphur has been used successfully to give satisfactory field control of this pest.

A regulation of May 1930 prohibits the importation of Subterranean Clover seed infected with eggs of *S. viridis*.

A 10 lb. sample of seed is combed for soil particles which are examined microscopically for eggs at the Seed Testing Station.

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## VARIOUS QUESTIONS

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#### **Report of the International Meeting Organised by the Italian Ministry for the Colonies for the Study of the Locust Problem. Rome, September 28-October 1, 1931 (2).**

For the purpose of coordinating biological studies of locusts in Africa and Western Asia, on the suggestion of the British Government, the Italian Government organised a scientific meeting at Rome on September 28, 1931, to which were invited representatives of the British Empire, France and the French Colonies and Protectorates and the International Institute of Agriculture.

Those present were : Messrs. H. B. JOHNSTON, Chief Locust Investigator, Imperial Institute of Entomology, and B. P. UVAROV, Senior Assistant, Imperial Institute of Entomology, representing the British Empire ; P. VAYSSIÈRE, Assistant

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(1) Communication from the Director of Agriculture, Department of Agriculture, Hobart, Tasmania.

(2) Communication from the Italian Ministry for the Colonies, transmitted to the International Institute of Agriculture by the Italian Ministry of Foreign Affairs.



Director of the Central Entomological Station, Professor at the Colonial Institute of Agronomy, representing France, French West Africa, French Equatorial Africa, Togo and Cameroon ; R. PASQUIER, Professor of Zoology at the Agricultural Institute of Maison-Carrée, representing Algeria ; P. RÉGNIER, Chief of the Service for Crop Protection, representing French Morocco ; F. SILVESTRI, Director of the Laboratory of General Zoology and Agricultural Entomology at the Higher Agricultural Institute, Portici, representing the Italian Ministry for the Colonies ; A. DE BÉNÉDICTIS, Chief of the Agricultural Office of Eritrea, representing Eritrea and Italian Somaliland ; G. KRÜGER, Government Entomologist for Cirenaica, representing Cirenaica and Tripolitania ; G. TRINCHIERI, Chief of the Plant Protection Section, representing the International Institute of Agriculture.

Messrs. E. VELLANI, Director, and E. GUGLIELMI, First Secretary to the Italian Ministry for the Colonies, were also present.

Professor F. SILVESTRI was unanimously elected President and Professor G. TRINCHIERI Reporter of the meeting.

All the Delegates were agreed that locusts are a cause of serious damage to all crops. It was agreed that of all known methods of locust control the best results, allowing of the protection of thousands of cultivated acres, are obtained by the use of poisoned baits. The composition and method of use may be varied slightly from one region to another.

A memorandum on 'Investigations on Tropical African Locusts' having been prepared by the British representatives the President proposed adopting this as a basis for the discussion.

Opinions are changing particularly with regard to the migrations of the Desert Locust (*Schistocerca gregaria* Forsk.) and the Tropical Migratory Locust (*Locusta migratoria* R. and F.) and to the probable position of the permanent breeding areas of these species.

There was perfect agreement among the members present in recognising that the discovery of the permanent breeding areas and ecological studies of these zones will constitute the most effective and economic means of protecting the cultivated regions.

A general questionnaire was drawn up modelled on that already distributed by the Imperial Institute of Entomology and by the 'Commission Française d'Étude des Calamités'.

The Delegates of Algeria and French Morocco however were in favour of a simpler questionnaire.

The meeting expressed the wish that all the countries concerned should periodically draw up maps, preferably on the same scale, concerning swarms, eggs and hatching of larvae.

Agreement was reached on the adoption of conventional signs for recording data concerning swarms, eggs and hatching of larvae on geographical maps.

These two documents are appended to the present report.

Finally the meeting requested the Italian Ministry for the Colonies to take the necessary steps to transmit to all countries subject to invasions of desert and tropical migratory locusts the following resolutions regarding the organisation of coordinated research :

'All prerogatives of the International Institute of Agriculture resulting from the International Convention of 31 October 1920, relating to the organisation of locust control, remaining unchanged, the meeting of British, French and Italian Delegates, regarded as of purely scientific standing, passed the following resolutions :—

' (1) That the Governments concerned should encourage studies of locusts ;  
' (2) That an institution situated in Europe should be made responsible for centralising, coordinating and studying biological data concerning locusts in Africa and Western Asia ;

' (3) That the Italian Government should transmit to the Governments concerned in these studies but not represented at the present meeting (1) an invitation to collaborate with the institution mentioned above ;

' (4) That in order to simplify the work of the central institution referred to in the second resolution, each Government should take into account the organisations already established for the purpose and nominate one or two centres to classify the documents received ;

' (5) That a meeting of specialists of all the Governments concerned should be held each year to make known the results of the past year's work and to draw up the programme for future research. A report of the meeting should be communicated to the International Institute of Agriculture. The next meeting might take place at Paris at the Fifth International Congress of Entomology if the French Government accepts this suggestion ;

' (6) That in view of the presence of specialists and a unique documentation (collections, bibliography, etc.) at the Imperial Institute of Entomology in London, this institution should be adopted by the Governments concerned as the centre for research on biology and taxonomy of locusts referred to in the preceding resolutions ;

' (7) That for the biological study of the Tropical Migratory Locust (*Locusta migratoria*) a survey should be carried out as early as possible in the regions thought to be the permanent breeding areas, particularly the region of Timbuku.

' The British entomologists now concerned in locust investigations in British West Africa are willing to undertake the work personally or preferably in collaboration with French entomologists.

' That it is desirable that the Commission nominated by the VIIIth North African Conference should study the question at its next meeting '.

Resolutions 1, 2, 3, 4, 5, and 7 were passed unanimously ; the representatives of Algeria and French Morocco abstained from voting for Resolution 6.

Rome, 1st October 1931.

Signed : FILIPPO SILVESTRI, *President* ; H. B. JOHNSTON ; B. P. UVAROV ;  
P. VAYSSIÈRE ; R. PASQUIER ; P. RÉGNIER ; ANTONIO DE BENEDICTIS ;  
GIORGIO KRÜGER ; G. TRINCHIERI, *Reporter*.

## QUESTIONNAIRE.

### I. — *Observations on the passage of swarms.*

- (1) Locality (longitude and latitude, or distance and orientation in relation to a well-known locality).
- (2) Date and hour.
- (3) Direction of flight.
- (4) Dominant colour of locusts: pink, red, yellow or brown.
- (5) Estimate of approximate size of swarm.
- (6) Height of flight.

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(1) Spain, Portugal, Liberia, Belgium, Abyssinia, Arabia, Iraq, Egypt, Persia, British India, Tunis.

(7) Speed of flight, estimate in certain cases of the time taken by the swarm to cover a known distance, for example between two villages

(8) Weather conditions: —

Wind and its direction and force in relation to the direction of flight.

Temperature.

Intensity of insolation.

Effects of sudden changes of weather on locusts (rain, storm, fall of temperature, etc.).

(9) What are the probable reasons for the swarm's alighting (time of day, change of weather, attraction of crops, etc.)?

(10) How long did the swarm remain on the ground and in what direction did it take flight? (Note also direction of wind).

(11) Were the locusts ready for laying?

(To determine this open the abdomen of several females and see whether it contains eggs and if so of what size).

(12) What plants, wild and cultivated, were attacked by the locusts and which were avoided?

(13) What natural enemies (birds, insects, etc.) were observed?

## II. — *Observations on laying (Primary swarms).*

(1) Locality.

(2) Date.

(3) Direction from which the swarm arrived (primary swarm).

(4) Weather conditions (more particularly rainfall) during the days (about one week) preceding the beginning of laying.

(5) Description of the breeding areas:—

Position (slope, valleys, canal banks, etc.).

Quality of the soil chosen (texture and moisture).

Vegetation.

(6) Length of time the swarm (primary swarm) remained.

When and in what conditions it took flight.

## III. — *Observations on eggs and hatching.*

(1) Situation and extent of land infested with eggs.

(2) Density of egg deposits (average number of egg clusters per square metre).

(3) Average number of eggs in a cluster.

(4) (a) Date of the first layings.

(b) Date of hatching of the first hoppers.

(c) Date of hatching of the last hoppers.

(5) Weather (specially rainfall) from laying to end of hatching (changes of weather, such as sudden rains, rise or fall of temperature, etc. should be noted).

(6) What natural enemies were observed?

## IV — *Observations on hoppers.*

(1) Locality and date of observations.

(2) Extent of zone infested with hoppers.

(3) Date of hatching of the first hoppers.

(4) Weather during development of the insects from hatching to adult stage.

(5) Description of situation preferred by the hoppers.

(6) What plants were eaten by hoppers?

What plants were avoided (differences on this point may occur according to the age of hoppers)?

(7) Size and density of the hopper bands.

(8) Are there present hoppers of abnormal colouring, particularly green? If so, in what proportion to those of normal colouring (black and yellow) do they occur? It is of the utmost importance that lots of 20 to 40 hoppers including all the colour variations should be collected in swarms of abnormal coloration and forwarded to the appropriate Entomological Station.

(9) What natural enemies (birds, insects, etc.) were observed?

## V. — *Observations on adults bred in the locality (Secondary swarm).*

(1) Locality and date of observations.

(2) Notes (if any) on the primary swarm in cases where there is no doubt concerning the relationship with the secondary swarm.

- VI. —
- Notes on preceding invasions.*

The years (and months if possible) of invasions, the districts or localities invaded ;  
 Characteristics permitting identification where possible of the species (colour,  
 size, etc.) ;

Was there breeding in the locality?

How and when did the invasion end?

Collect native sayings, customs, superstitions, etc., concerning locusts at all stages of development. Native names should be noted, whether designating locusts in general or particular species.

• • • • •

↑ Swarm flying in a known direction (date and approximate size of the swarm one on each side of the arrow).

Swarm in flight, direction not specified.

▲ Swarm on the ground.

Swarm on the ground departed in a known direction.

▲ Swarm on the ground arrived from a known direction.

## 6 Swarm eddying.

△ Laying swarm.

○ Breeding area.

● Larvae.

s Typical solitary phase.

For adults only { *Red* — pink adults.  
                           *Green* — reddish brown adults.  
                           *Blue* — yellow adults.  
                           *Black* — colour unknown.

## LEGISLATIVE AND ADMINISTRATIVE MEASURES

**Italy.** — By Ministerial Decree of 12 October 1931 the Commune of Tortoreto in the province of Teramo has been declared infected with grape phylloxera. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 20 ottobre 1931, anno 72<sup>o</sup>, n. 243, p. 5136).

**\*\*** By Ministerial Decree dated 14 November 1931 all the viticultural districts of the Communes of the province of Pesaro e Urbino have been declared infected with grape phylloxera.

The same measure has been adopted by Ministerial Decree of 24 November 1931 regarding the Commune of Caggiano in the province of Salerno. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 2 dicembre 1931, anno 72<sup>o</sup>, n. 278, p. 5867).

**\*\*** A Ministerial Decree of 18 November 1931 containing the integrant provisions concerning the technical special regulations for the exportation of citrus fruits establishes, *inter alia*, that exportation of gummy fruits, of frost damaged fruits and of fruits seriously affected with sooty mould is prohibited. Mandarin oranges intended for export must be sound, free from lesions and other defects. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 10 dicembre 1931, anno 72<sup>o</sup>, n. 277, pp. 5836-5839, 8 figg.).

**Aegean Islands (1).** — By Governorial Decree No. 247 dated 26 December 1931, it is forbidden to introduce vine cuttings and layers, plants and their parts of citrus, plants and their parts of mulberry and banana plants.

The Governorial Decree No. 55 of 2 April 1930 (see this *Bulletin*, 1930, No. 7, p. 106) is annulled.

**Yugoslavia (2).** — On the basis of the Law of 9 December 1929 for the protection of cultivated plants the Minister of Agriculture issued on 9 November 1931 a regulation by which all consignments of plants or plant parts (fruit trees and tree fruits, with the exception of tropical fruits, ornamental plants, trees and shrubs, flowers, plants, cuttings and bud slips, bulbs and rhizomes), and fresh plant debris must be accompanied by a health certificate issued by a competent official and duly authorised by the exporting country and conforming to the model annexed to the International Convention for Plant Protection adopted at Rome on 16 April 1929 (see this *Bulletin*, 1929, No. 4, p. 55). Certificates coming from North and South America, Australia, Japan, China and the Hawaiian Islands must carry a statement to the effect that the consignment is free from *Leptinotarsa decemlineata*, *Popillia japonica*, *Aspidiotus perniciosus* and *Phthorimaea operculella* in particular.

(1) Communication from the official correspondent of the Institute, Dr. Francesco Dessy, Director of Agriculture and Forests, Government of the Aegean Islands, Rhodes.

(2) Communication from the official correspondent of the Institute, Dr. Mladen Josipović, Professor of Plant Pathology in the Faculty of Agriculture and Forestry, Belgrade.

The certificates must be in the language of the exporting country and in a language recognised as an international language. Certificates issued more than seven days previous to consignment will not be held valid.

The phytopathological control stations of Yugoslavia are entitled to inspect consignments of plants or plant parts even if they are accompanied by a health certificate.

\*\*\* With the purpose of preventing the introduction into Yugoslavia of serious diseases and pests of the potato (*Synchytrium endobioticum*, *Leptinotarsa decemlineata* and *Phthorimaea operculella*) the Minister of Agriculture has issued a regulation, dated 9 November 1931, by which the importation and transit of potatoes infected with such diseases and pests is prohibited. It is also forbidden to import or cause the transit of potatoes coming from a country in which the presence of wart disease (*S. endobioticum*) and the pests mentioned has been determined. Consignments of potatoes coming from other countries must be accompanied by a sanitary certificate issued by an authorised official of the exporting country, containing: (1) a declaration by the producer of the origin of the goods, endorsed by the local competent authorities; (2) a declaration by the official stating: (a) that the country of origin is free from wart disease, *Lept. decemlineata* and *Phth. operculella*; (b) that he has personally and officially inspected the goods in the bags or cases and found them healthy; (c) that the seals of the official plant sanitary establishment were affixed in his presence to the packages or to the wagons. The certificate must also bear the number of the sealed wagon, the number of packages and the text of the seal. Importation will be allowed only of potatoes which are contained in new bags or cases not previously used.

Importation of potatoes may take place only by the following frontier stations: Sušak, Rakek, Jesenice, Maribor, Drnje (Koprivnica), Beli Manastir, Kelebia, Velika Kikinda, Caribrod and Djevdjelia and by the ports of Sušak, Split and Dubrovnik.

Consignments of potatoes presented for importation will be inspected at the stations and ports specified above by the State plant sanitary control services, even when the consignments are accompanied by the required certificates.

Transit of potatoes through Yugoslavian territory is authorised only in direct wagons which are well closed, sealed and accompanied by a certificate of health and origin.

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[The harmful species of locusts in Spain are *Calliptamus italicus*, *Dociostaurus maroccanus* and *Decticus albifrons*].

INTERNATIONAL ADDRESS BOOK OF BOTANISTS. Being a directory of individuals and scientific institutions, universities, societies, etc., in all parts of the world interested in the study of botany. Prepared in accordance with a resolution passed at the Fifth International Botanical Congress, Cambridge, 1930. London, Published for the Bentham Trustees by Baillière, Tindall and Cox, 1931, pp. XV+605.

[This address book of the botanists of the world, which has already received a preliminary notice in this *Bulletin* (1931, No. 8, p. 156) supplants the now out-of-date third edition of the 'Botaniker-Adressbuch' of I. Dörfner (Vienna, 1909). It has been prepared and published under the direction of an international committee composed of Prof. Dr. L. Diels (Germany), Dr. E. D. Merrill (United States of America) and the late Dr. F. T. Chipp (England). The volume opens with three separate lists of the countries in respectively English, French and German, followed by a list of the abbreviations used in the text. The countries are arranged in the text in alphabetical order and the names are given in each case in English, French and German. The text for each country is as far as practicable in the language of the country in Roman script. The lists under the headings of the countries include the Societies, the research institutions and colleges with their addresses, the names of the botanists with the academic titles, profession, address and special subject of each. At the end of the book is an alphabetical list of the names of the botanists included].

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[The insect concerned, still unidentified, was observed in New Caledonia].

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[The bait used, which was a mixture of imitation vanilla essence, ammonia and water, was found to be attractive particularly to *Chaetodacus tryoni* and *Ceratitis capitata*].

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[*Diaspis leperii*, *D. pentagona*].

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[*Sciurus leucurus*, *S. carolinensis*].

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[In this supplement to the book published in 1929 under the same title are included all the work in continuation and the new editions issued up to December 1930. In pp. 56-59 of the new volume are enumerated works on general biology, as well as on botany and zoology in particular].

MONTEMARTINI, L. L'Osservatorio fitopatologico di Palermo negli anni 1929-1931. *Rivista di Patologia Vegetale*, Pavia, 1931, anno XXI, n. 9-10, pp. 257-279.

[Report of the work of the Observatory].

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[The cause of this affection is still unknown].

PASSY, PIERRE. La mouche des pêches, sa destruction. *Revue Horticole*, Paris, 1931, 103<sup>e</sup> année, n° 24, p. 584-585.

[*Ceratitis capitata*].

PETRI, L. Il metodo d'isolamento della « *Phytophthora cambivora* ». *Bollettino della R. Stazione di Patologia Vegetale* [di Roma], Firenze, 1931, anno XI, n. s., n. 3, pp. 214-221, figg. 1-3.

PETRI, L. La coltivazione del castagno giapponese in Italia. *Bollettino della R. Stazione di Patologia Vegetale* [di Roma], Firenze, 1931, anno XI, n. s., n. 3, pp. 275-284, figg. 1-4.

[The writer refers to the progress of the plantations of Japanese chestnuts (*Castanea crenata*), resistant to ink disease (*Phytophthora cambivora*), in various parts of Italy].

PETRI, L. Provvedimenti necessari per far fronte alla moria degli olmi. *Bollettino della R. Stazione di Patologia Vegetale* [di Roma], Firenze, 1931, anno XI, n. s., n. 3, pp. 284-289.

[Control of the resistance to *Graphium Ulmi* of Asiatic species of *Ulmus* (*U. pumila*, *U. japonica*, *U. Wilsoniana*, etc.) and investigation of the production of hybrids and the selection of strains resistant to the disease].

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[*Phylloxera vastatrix*].

PUECHER PASSAVALLI, LUIGI. Le malattie del castagno. *L'Alpe*, Milano, 1931, anno XVIII, n. 12, pp. 333-340, 12 figg.

[*Blepharospora cambivora*, *Armillaria mellea*, *Rosellinia necatrix*, *Hypholoma fasciculare*, *Polyporus sulphureus*, *P. fulvus*, *P. hispidus*, *Daedalea quercina*, *Fistulina hepatica*, *Coryneum perniciosum*, *Diplodina Castaneae*, *Sphaerella maculiformis*, *Microsphaera quercina*, *Penicillium crustaceum*, *Rhacodium cellare*, *Phoma endogena*, 'cipollatura' (due to various causes), cork chafer, mole-cricket, *Lachnus longipes*, *Agriotes angustulus*, *Callidium variabile*, *C. sanguineum*, *Platypus cylindricus*, *Phymatodes lividus*, *Eccoctogaster intricatus*, *Xyleborus dryographus*, *X. dispar*, *Zeuzera pyrina*, *Cerambyx scopolii*, *Polydrusus sericeus*, *P. atomarius*, *Lymantria dispar*, *Malacosoma neustria*, *Phalera bucephala*, *Acronycta aceris*, *Nepticula castanella*, *Carpocapsa splendana* var. *reaumuriana*, *Balaninus elephas*].

PUECHER PASSAVALLI, LUIGI. Le malattie del faggio. *L'Alpe*, Milano, 1931, anno XVIII, n. 12, pp. 453-457, 7 figg.

[*Phytophthora Fagi*, *Pestalozzia Hartigii*, *Armillaria mellea*, *Nectria ditissima*, *Stereum hirsutum*, *Hydnum diversidens*, *Polyporus hispidus*, *Fomes ignarius*, *F. fomentarius*, *Phyllactinia suffulta*, *Microsphaera quercina*, *Lymantria dispar*, *Euproctis chrysorrhoea*, *Malacosoma neustria*, *Hybernia defoliaria*, *Dasychira pudibunda*, *Lithocolletis faginella*, *Lachnus fagi*, cork chafer, *Polyphylla fullo*, *Phyllobius argentatus*, *P. maculicornis*, *P. viridicollis*, *Rhynchites betuleti*, *Orchestes fagi*, *Megachile centuncularis*, *Cecidomyia fagi*, *Cryphalus fagi*, *Xyleborus saxeseni*, *Xyloterus domesticus*, *Agrilus viridis*, *Cerambyx scopolii*, *Pyrrhydium sanguineum*].

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[*Kakothrips robustus*, *Thrips* spp., *Haplothrips* spp., *Limothrips denticornis*, *Taeniothrips inconsequens*, *Porphyrothrips cotei*, *Heliothrips haemorrhoidalis*, *Parthenothrips dracaenae*, etc.].

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[*H. gibberosporum* causes a disease of the banana (*Musa Cavendishii*) in Italian Somaliland].

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[The contents include :— 12. Schädlinge der Orchideen (S. 60-64)].

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[*Chrysomphalus dictyospermi*].

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[*Dizygomyza cepae*].

SPRENGEL, L. Epidemiologische Forschungen über der Traubenwickler *Clysia ambigua* und ihre Auswertung für die praktische Grossbekämpfung. *Wein und Rebe*, Mainz 1931, 13. Jahrg., Nr. 7, S. 270-287, Abb. 1-5.

SPRENGEL, L. Über zwei Hyperparasiten von *Aphelinus mali* Hald. *Anzeiger für Schädlingskunde*, Berlin 1931, VII. Jahrg., Heft 11, S. 130.

[*Asaphes vulgaris*, *Pachyneuron aphidis*].

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[*Pythium* ? *artotrogus*, *Phoma apiicola*, *Septoria Apii*, *Psila rosae*].

STOLZE, KARL VIKTOR. Beitrag zur Biologie, Epidemiologie und Bekämpfung der Blattfleckenkrankheit der Zuckerrübe (*Cercospora beticola* Sacc.). *Arbeiten aus der Biologischen Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem*, Berlin 1931, XIX. Bd., Heft 4, S. 337-402, Fig. 1-24. Schriftenverzeichnis, S. 399-402.

SWEZEY, O. H. Insect pests of sugar-cane in Hawaii. *The Mid-Pacific Magazine*, Honolulu, 1931, Vol. XLII, No. 4, pp. 324-327, figs. 1-5.

[*Rhabdocnemis obscura*, *Perkinsiella saccharicida*, *Anomala orientalis*, *Cirphis unipuncta*, *Spodoptera mauritia*, *Omiodes accepta*, *Aphis sacchari*, *Trionymus sacchari*, *Oxya chinensis*].

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[*Ustilago Triticici*].

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[*Uncinula necator*].

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[*Botrytis elliptica* (Berk.) Cooke].

VECCHI, ANITA. Le api e le irrorazioni arsenicali ai frutteti. *L'Italia Agricola*, Piacenza, 1931, anno 68°, n. 11, pp. 840-844.

VERNON, T. R. An improved type of moist chamber for studying fungal growth. *Annals of Botany*, London, 1931, Vol. XLV, No. CLXXX, pp. 733-737, figs. 1-2.

VERPLANCKE, GERMAIN. Expériences sur la transmission des maladies de dégénérescence de la pomme de terre. II. — Résultats des essais faits en 1931. *Annales de Gembloux*, Bruxelles, 1931, 37<sup>e</sup> année, 11<sup>e</sup> livr., p. 345-349.

VOGLINO, P. Le macchie brune degli astri della Cina. (*Phyllosticta Asteris* Bresadolola). *Bollettino del Laboratorio Sperimentale (Regio Osservatorio Regionale) di Fitopatologia*, Torino, 1931, anno 8, n. 6, pp. 1-3.

WOLLENWEBER, H. W., und RICHTER, H. Infektionsversuche mit *Graphium ulmi* an Ulmen und anderen Laubbäumen. *Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin 1931. 11. Jahrg., Nr. 11, S. 89.

# INTERNATIONAL BULLETIN OF PLANT PROTECTION

1932

No. 2

## DISCOVERIES AND CURRENT EVENTS \*

### North Africa and French West Africa: Desert Locust (*Schistocerca gregaria*) (1).

Swarms observed during October 1931:—

On the 7th a large swarm in the region of Fom Joul, 25 km N. W. of Atar.

On the 14th a swarm on the palm plantation of In Salah and one at Bilma.

On the 15th a swarm at Saret, 80 km S. of El-Goléa.

On the 16th a swarm over In Salah coming from S.E.

On the 20th a swarm over El-Goléa and one at Oued Bou Demaun and Bou Guema, 70 km S.S.E. of Timimoun.

On the 22nd a swarm between Battin and the oasis of Timimoun.

On the 25th a large swarm over In Salah.

On the 29th a swarm at Adrar and over the oasis of Touat; a swarm between the Oued Tatta and the Oued Draa; a swarm at Igherm, 120 km E.S.E. of Agadir.

On the 31st a swarm 18 km from Her-Eando on the frontier between Algeria and Morocco; a swarm over the tribe of Ida Ougnidif, 80 km S.E. of Agadir.

### England and Wales: New and Interesting Phytopathological Records for the Year 1931 (2).

(a) Plant parasitic fungi encountered in England and Wales during the year 1931 and believed not to have been recorded there previously:—

*Kunkelia nitens* (Schw.) Arth. On Dewberry plants (*Rubus*; species unknown) recently introduced from U.S.A.

*Chalaropsis thielavioides* Peyr. Found on the surface of carrots (*Daucus*) that had been kept in store. Parasitism doubtful. A form of the same fungus was encountered in association with Walnut (*Juglans*) graft failures.

*Stagonospora Fragariae* Briard and Hariot. What appears to be this fungus was found causing a leaf - and fruit - spot of strawberry in the west of England.

*Sclerotium rhizodes* Auersw. Causing considerable destruction in an upland meadow in Derbyshire on *Agrostis*.

*Uromyces Trifolii* (Hedw. f.) Lév. The uredo- and teleutosori of this Rust are not uncommon on clover (*Trifolium pratense*) in England and Wales, but its aecidia were seen for the first time during 1931.

\* In this, as in the next chapter the countries are arranged in French alphabetical order.

(1) Communication from the Government General of Algeria to the International Institute of Agriculture.

(2) Communication from the Ministry of Agriculture and Fisheries, London, official correspondent of the Institute.

(b) The parasites mentioned below are not new to the country, but their occurrence on the particular hosts mentioned is interesting, as it is believed to be the first of the kind in each case recorded for England and Wales :—

*Mycosphaerella pinodes* (B. & Br.) Vestergr. On Sweet Pea (*Lathyrus odoratus*).

*Gloeosporium album* Osterw. On fruit of quince (*Cydonia vulgaris*).

*Heterosporium Allii* var. *cepivorum* Nic. and Agg. On leaves of onion.

*Sclerotium Tuliparum* Kleb. On corms of *Colchicum* sp.

(c) The Chrysanthemum Midge, *Diarthronomyia hypogaea*, F. Löw (see this *Bulletin*, 1929, No. 7, p. 97) now appears to have been eradicated, no trace of this pest having been discovered during 1931.

### United States of America : Diseases of Peanuts (1).

Interest in diseases of peanuts in the United States has heretofore centered largely on diseases of the foliage, particularly the Leaf Spot (*Cercospora personata*). A survey made during the summer of 1931, in the States of Virginia, North and South Carolina, Georgia, and Alabama, indicates that certain diseases of the nut are of commercial importance also. One of the most important diseases of the nut is apparently the southern blight caused by *Sclerotium rolfsii*. Various fungi, *Fusarium* sp., *Diplodia* sp., etc., were found causing discoloration of the shells after the vines had been stacked. A number of fungi, some of which have not yet been determined, have been isolated from diseased pods and nuts.

Perhaps the heaviest loss is due to the fruiting stems becoming so weakened that the adhering soil pulls the nuts off the bush and the nuts are left in the ground. Losses from this cause as determined by actual weight of nuts left in the soil varied from 1-30 % in the southern and coastal plain regions. The staining or spotting of the pods of the larger fancy varieties by various fungi makes it impossible to sell the nuts in the shell and this results in a lower price to the grower. Finally, some of the nuts may be so seriously diseased that they have to be discarded in the factory. The amount of these 'pick outs' varied from 2-10 % in factories visited during October, 1931.

Southern blight is apparently generally distributed throughout the peanut belt of the Southeast, but is more severe in sandy than in clay lands, and is apparently abundant in fields where fertilizer or lime has been employed during the past season.

In general, Leaf Spot, *Cercospora personata*, was more severe in the southern part of Georgia and the coastal plain regions of the Carolinas and Virginia than it was in the Piedmont regions of the same States.

### India : New Diseases Reported during the Year 1931 (2).

Pusa (Reported by Dr. W. McRAE, Imperial Mycologist,<sup>1</sup> Imperial Institute of Agricultural Research).

*Trichosanthes dioica* :— *Synchytrium* sp. on fruits.

Control measures. — The diseases of piper-betel caused by *Rhizoctonia solani*

(1) Communication from the official correspondent of the Institute, Dr. Neil E. STEVENS, Senior Pathologist in Charge, Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington.

(2) Communication from the official correspondent of the Institute, Mr. W. McRAE, M. A., D. Sc., F. L. S., Imperial Mycologist, Imperial Institute of Agricultural Research, Pusa, Bihar, India.



and *Sclerotium rolfsii* can be controlled by watering with a 0.07 per cent solution of Kerol at regular intervals.

**Bombay Presidency** (Reported by Dr. B. N. UPPAL, Plant Pathologist).

*Sorghum vulgare* :— *Rhizoctonia bataticola*.

Control measures. — Gummosis of citrus can be effectively controlled by treating with Creosote oil and is preferable to 50 per cent carbolic acid which sometimes causes injury to treated trees.

**Bengal** (Reported by Mr. G. P. HECTOR, Economic Botanist).

*Asclepias* sp. :— *Diplodia* sp. Spraying with 1 per cent Bordeaux mixture gives good results.

**Punjab** (Reported by Mr. J. C. LUTHRA, Economic Botanist).

*Cicer arietinum* :— *Phyllosticta rabiei* (Pass.) Trotter, causing gram blight.

**Mysore** (Reported by Mr. M. J. NARASINHAM, Mycologist, Department of Agriculture, Mysore State).

*Aleurites fordii* :— A strain of *Phytophthora palmivora* Butl. (*P. Faberi* Maubl.) was discovered on the leaves of the Tung oil tree. It reacts like a female strain forming oospores with the strain on areca but not with that on Santalum.

### **Morocco (French Zone): Desert Locust (*Schistocerca gregaria*) (1).**

Movements of swarms of *Schistocerca gregaria* Forsk. from 15 December 1931 to 25 January 1932.

In the region of Ouarzazat a good sized swarm flying east passed over Foun Z' Guid (100 km S. of Ouarzazat) on 10 January.

In the Sous a swarm of 10 × 2 km coming from the east alighted on 29 December in the tribe of Haouara 10 km W. of Taroudant (colour brick red). Another swarm of 8 × 2 km coming from the south alighted at the same point on 7 January.

In the Atlas mountains a swarm of red locusts, 6 × 2 km, coming from Ida ou Tanant passed over Tanianar on 16 December and alighted at Ida ou Bonzia. It remained there from the 7th to the 20th, when it alighted again at Imigrad near Dar Cheikh Tajabrit, 50 km S. of Mogador, and remained until the 22nd. On the 22nd it flew south and alighted in the tribe of Ida ou Kasseou, 16 km S. E. of Tamaran. Another swarm alighted at Ait Zeltern, 45 km S. E. of Mogador, on the 26th, left on the 27th and alighted again in the tribe of Meskala, 30 km E.S.E. of Mogador.

In the regions to the north of the Atlas range a swarm alighted on 28 December in the Nairat division coming from the south-west; it was kept on the ground by rain on the 29th and the locusts were collected and killed. Several swarms alighted on 8 January at Menacir, 48 km N. E. of Mogador, at Aguermond, 27 km N. E. of Mogador, and at Salla, 33 km N. E. of Mogador; they remained on the ground on the 9th and flew away together on 10 January towards Abda.

In the Sous region a large and very dense swarm of reddish-grey locusts flying from south to north passed over Tiznit on 19 January 1932 and alighted to the north of this centre; it departed on the 20th at about midday in a north-easterly

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(1) Communication from Mr. P. RÉGNIER, Chief of the Crop Protection Service of Morocco (French Zone), Rabat, transmitted to the Institute by Mr. DELASSUS, Crop Protection Inspector for Algeria and Chief of the Regional Locust Station of Algiers.

direction. Another swarm of  $20 \times 10$  km coming from the south alighted on the 19th at Haouara, 28 km south-west of Taroudant.

In the Atlas mountains a large swarm of red locusts coming from Ida ou Tanant alighted on 13 January between Ait Ameer and Ida ou Trouma, 22 km south of Tamanar. Another swarm on the night of the 14th passed 25 km to the south of Tamanar. A large dense swarm of  $20 \times 6$  km coming from the south alighted on 10 January at Ida ou Zal, 25 km south-east of Argana, passed on the 14th over this post, circled round and departed in a north-easterly direction. A small swarm 200 metres in length coming from 35 km to the south of Mogador alighted 45 km south-east of Mogador on the 16th; it departed on the 17th towards Meknassa, 32 km south-east of Mogador. A swarm of red locusts, very dense and  $20 \times 4$  km, coming from Haouara passed on the 21st over Argana flying north. A red swarm of low density alighted on the 20th at Ait Aissi, 25 km east of Tamanar, and departed on the 21st in a northerly direction.

In the regions of Mogador and Safi a swarm coming from the north alighted on 12 January 50 km south of Safi. Another swarm coming from the north-west alighted 50 km north-east of Mogador on the 13th. A swarm of  $6 \times 4$  km coming from the west alighted on the 11th 50 km E. S. E. of Safi; after some hours they departed towards the north (Doukhala). This swarm departed on the 17th towards the east and on the 23rd reached 12 km to the west of Dar Ouled Zidouh (Talda) after having crossed the region to the north of El Kelaa des Sgharna.

#### Mexico: Panama Disease of Bananas (1).

*Fusarium cubense* var. *inodoratum* Brandes, the cause of Panama disease, has been found on specimens of banana plants collected in the State of Tamaulipas and sent by the 'Oficina Federal para la Defensa Agrícola' to Dr. H. W. Wollenweber of Berlin.

This very serious disease is thus shown to be present also in Mexico.

The 'Oficina' has already undertaken extensive investigations to determine the infected localities in order to take the necessary measures.

The north-eastern region, which is very rich and includes the States of Nayarit, Sinaloa and Sonora, has been protected since 1927 against importation of banana suckers from other regions of the Republic by 'Cuarentena Interior No. 2' and from foreign countries by 'Cuarentena Exterior No. 7'.

There will shortly be brought into force an internal quarantine order regulating the circulation of banana plants within the Republic and controlling the cultivation of the banana.

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### LEGISLATIVE AND ADMINISTRATIVE MEASURES

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**Germany.** — In accordance with an Order of 3 November 1931 and with the purpose of avoiding the introduction of the San Jose scale (*Aspidiotus perniciosus*) it is forbidden until further notice to import into Germany living plants or parts of plants coming from America, Australia (including Tasmania and New Zealand), the Hawaiian Islands, Japan, China, British India, Mesopotamia and the Union

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(1) Communication from the official correspondent of the Institute, Dr. Alfonso DAMPF, Jefe del Departamento de Investigación, Oficina Federal para la Defensa Agrícola, San Jacinto, D. F.

of South Africa. This regulation applies also to any materials which have been used for packing or storing such living plants or plant parts.

Fresh fruits and their residues coming from the countries specified above may be imported only by the customs offices authorised by the German Government and if contained in the original packages and on condition that inspection on entry, carried out at the expense of the importer, shows them to be free from the presence or the suspected presence of the San Jose scale, and of apple maggot (*Rhagoletis pomonella*) if the consignment is coming from the United States of America or Canada.

Exceptions to this Order may be allowed by the Minister of Agriculture. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin 1931, 11. Jahrg., Nr. 12, S. 103-104).

\* \* By Decree of 26 November 1931 the Minister of Agriculture has provided the measures for the application of the Decree of 3 November 1931 concerning the prevention of the introduction of the San Jose scale (*Aspidiotus perniciosus*) and the apple maggot (*Rhagoletis pomonella*).

It is forbidden to import any Dicotyledonous tree or shrub (exclusive of the Cactaceae), by which is particularly intended any species of fruit tree.

Any other tree or shrub may be imported provided that it is not forbidden by any other legislative measure and that inspection at the custom office has not ascertained the presence or suspected presence of the San Jose scale.

Importation of underground parts of plants and of seeds, vegetables, drugs and raw products for industry is allowed.

This Decree is equally applicable to living plants and parts of living plants transported in passengers' luggage.

For determining the presence or absence of the San José scale inspection will be based on the 'Anleitung für die Untersuchung von Pflanzen, Obst und Kartoffeln bei der Einfuhr' (Instructions for the inspection of plants, fruits and potatoes on importation) issued by the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem.

Importation is allowed of the so-called southern fruits ('Süd-fruchte': citrus fruits, raisins, bananas, pineapples, etc.), as also of all kinds of dried fruits and dried fruit residues. This Decree does not apply to fruits transported in passengers' luggage.

To prevent consignments refused on account of the presence of the San Jose scale or the apple maggot being presented at another custom office inspectors will report every finding of the presence of the insects specifying the name of the consignee and the number of the consignment.

A Decree of 7 November 1931 contains a list of the custom offices authorised to accept consignments of fruits and fruit residues coming from America, Australia, including Tasmania and New Zealand, the Hawaiian Islands, Japan, China, British India, Mesopotamia and the Union of South Africa (1).

**Germany (Oldenburg) (1).** — By Decree of 10 October 1931 similar legislative measures have been provided for the control of elm disease (*Graphium Ulmi*) as were adopted for the Free State of Bremen by the Order of 31 March 1931 (see this *Bulletin*, 1931, No. 6, p. 97).

(1) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

**Germany (Prussia) (1).** — A Decree of 7 November 1931 of the Minister of Agriculture, Lands and Forests provides that plants and fruits for importation will not be examined by experts on Sundays or holidays or during the night, except in cases of urgency and on the special request of the importer. The importer will in such a case pay, in addition to an extra charge of 10 RM. for each consignment, a supplement of 50 %.

**Germany (Saxony) (1).** — By Decree of 16 November 1931 the Decree of 1 April 1930 (see this *Bulletin*, 1930, No. 10, p. 152) concerning the control of potato wart disease (*Synchytrium endobioticum*) has been amended.

In future it will be allowed to plant potatoes from a crop which has not been inspected in the field provided that they belong to varieties recognised resistant to wart disease and in compliance with certain conditions, viz, that the potatoes are delivered directly to the planter either by the producer or through the agency of the communal authority, with special care that they do not become mixed with other potatoes.

The Decree contains a new list and descriptions of 14 varieties of potatoes recognised resistant to wart disease and available for planting in regions infected with the disease.

**Western Australia.** — On 19th November 1931 the Director of Agriculture notified that Cape Tulip (*Homeria collina* and *H. miniata*) and *Watsonia* have been declared noxious weeds within the boundaries of the Bayswater Road Board and of the Capel Road Board districts respectively. (*Government Gazette of Western Australia*, Perth, November 20, 1931, No. 62, p. 2483)

**Belgium.** — On 18 November 1931 the Belgian Chargé d'Affaires in Rome deposited with the Royal Ministry for Foreign Affairs the ratification by his Government of the International Convention for Plant Protection, which was signed at Rome on 16 April 1929 (see this *Bulletin*, 1929, No. 4, pp. 50-55), accompanied by a declaration concerning the institutions referred to in Art. 2, Nos. 1 and 2, of the Convention (Art. 22).

The Belgian Embassy stated, moreover that the Convention would apply also to the Belgian Congo and to the territories under Belgian mandate. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 25 gennaio 1932, anno 73<sup>o</sup>, n. 19, p. 416).

**Spain.** — By 'Orden' of 18 November 1931, effective as from 10 January 1932, the importation of spawn for cultivation of the mushroom [*Agaricus campester*] will no longer be allowed unless consignments are accompanied by a certificate officially issued by the Phytopathological Service of the country of origin, stating (a) that the manure used for growing the spawn was sterilised before sowing (the method of disinfection to be stated); (b) that the spawn was grown from a pure mushroom culture; (c) that the spawn contains no germs of diseases injurious to plants grown in the Republic. (*Gaceta de Madrid*, Madrid, 21 noviembre 1931, año CCLXX, tomo IV, núm. 325, pág. 1126).

**Estonia.** — The Order No. 5115 of the Ministry of National Economy, dated 20 July 1931, contains a list of the products intended for use in the control of plant

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(1) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

diseases and pests and weeds which are allowed to be imported free of custom duty. To benefit from this free entry the products must, except in the case of calcium and sodium arsenates, be imported in their original packings. (*Deutsches Handels-Archiv*, Berlin 1931, 85. Jahrg., S. 2834).

**France.** — A Decree of 9 November 1931 provides for the creation and organisation of a Colonial Chair of Plant Pathology and a Colonial Chair of Agricultural Zoology at the National Institute of Colonial Agronomy at Nogent-sur-Marne (Seine).

The principal objects of these two chairs will be respectively the study of non-parasitic diseases and vegetable parasites of tropical crops and the study of useful insects and pests of tropical crops. (*Journal Officiel de la République Française*, Paris, 17 novembre 1931, LXIII<sup>e</sup> année, n° 268, p. 11871-11872).

**Honduras.** — There are no measures concerning plant protection and seed control. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 53).

**Luxemburg (Grand Duchy of)** (1). — By Ministerial Notice of 24 October 1931 bringing into effect the provisions of the Ministerial Decree of 24 September 1923, all consignments of potatoes coming from Belgium must be accompanied by a certificate issued by the Phytopathological Service stating that the potatoes come from a district free from wart disease [*Synchytrium endobioticum*].

Potatoes may be considered as coming from a district free from infection if they are grown and packed in a place situated at least 20 km from any wart disease infection.

**Nicaragua.** — The importation of sacks, whether full or empty, which have been previously used is forbidden. There are no other measures relating to plant protection. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 66).

**Panama.** — There are no measures relating to plant protection and seed control. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 73).

**Peru.** — By Presidential Decree of 12 August 1931, Art. 1 of the Decree of 13 June 1914 has been modified to give to the Department of Agriculture and Animal Husbandry of the Ministry of 'Fomento' the right to authorise importation of living plants by the customs offices of the various ports of the Republic; the plants will be inspected at the ports by the Chief of the Plants and Seeds Inspection Service and by experts of the agricultural stations and commissions. Importers must be provided with permits for the plants and must defray the costs of inspection. (*Boletín de la Compañía Administradora del Guano*, Lima, Perú, 1931, vol. VII, no. 8, págs. 409 y 410).

**Dominican Republic.** — With a view to protecting the rice crops from diseases and pests not occurring in the Republic, by Presidential Decree No. 119 of 25 April 1931 it is forbidden to introduce paddy from any provenance or for any purpose.

This restriction does not apply to small quantities of seed rice for the 'Departamento de Agricultura de la Secretaría de Estado de Agricultura y Comercio' ex-

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(1) Communication from the official correspondent of the Institute, Mr. V. FERRANT, Officer in Charge, Phytopathological Service, Luxembourg.

clusively for experimental purposes. The official inspector of plants and seeds will disinfect the seed rice before forwarding it to the Department. (*Revista de Agricultura y Comercio*, Órgano oficial del Departamento de Agricultura y Comercio, Santo Domingo, R. D., 1931, vol. XXI, no. 20, pág. 95).

\*\*\* For purposes of plant protection by Presidential Decree No. 121 of 1 May 1931 it is absolutely prohibited to introduce or import plants, seed or slips of cassava [*Manihot*] from the Republic of Haiti. It is also forbidden to import or introduce substances extracted from the cassava plant of the same provenance unless they have been treated by heat. (*Ibid.*, pág. 96).

**Italian Somaliland.** — By Governatorial Decree No. 8475 of 14 March 1931 a Phytopathological Service was instituted for Italian Somaliland, under the Office of Agriculture, the duties of the new Service being as follows:—

(a) to carry out microbiological, pathological and zoological research as applied to agriculture;

(b) to provide for the supervision of the nursery and other establishments concerned in the production of plants, parts of plants and seeds for commercial purposes;

(c) to provide for the distribution of knowledge relating to plant diseases and pests and their control;

(d) to supervise the importation and exportation of plants and plant parts with a view to preventing the entrance of new diseases and pests and the spread of those already present;

(e) to issue certificates relating to the condition of health and origin of consignments of plants and plant parts. (*Bollettino Ufficiale della Somalia Italiana*, Mogadiscio, 31 maggio 1931, anno XXI, n. 5, p. 82).

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are injurious. Former lack of interest in these subjects. — VII. The world  
ng up. What we are doing to combat the insect menace. Insect-control  
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## NOTES

**Congress of the International Union of Forestry Research Institutes.**— The programme of this Congress to be held at Nancy, France, 4-11 September 1932, includes a study of questions concerning physiological and cryptogamic diseases of forest trees and forest entomology.

In consideration however of the fact that the Fifth International Congress of Entomology (see this *Bulletin*, 1931, No. 9, p. 180) is to be held in Paris from 16 to 23 July 1932, the Forest Entomology Section of the International Union of Forestry Research Institutes will meet at Nancy about July 15 in order to allow forest entomologists to attend both Congresses.

# INTERNATIONAL BULLETIN

## OF PLANT PROTECTION

1932

No. 3

### DISCOVERIES AND CURRENT EVENTS \*

Eritrea : Locusts (*Schistocerca gregaria* and *Locusta migratorioides*) (1).

During December 1931 swarms of *Schistocerca gregaria* and *Locusta migratorioides* were reported.

On the 10th numerous reddish coloured desert locusts (*Schist. gregaria*) coming from the south reached the Catra plain and divided into two groups, one of which flew in the direction of Scillichì and the other towards the Ghedem.

On the 13th individuals of undefined colour from the Barca reached Dembelas in the western plain ; on the 14th they returned towards the region they had come from.

On the 18th a few groups of hoppers of *Loc. migratorioides* and *Schist. gregaria* were observed and destroyed in the neighbourhood of Sceeb.

On the 18th and 19th more desert locusts flew around the territory of Dembelas.

On the 22nd a swarm coming from the south passed over the Ghirghir valley flying west ; another swarm coming from Ennadecco (Egghelà Hames) after crossing the Meretta Sebenè flew in the direction of the Seraè. These two swarms also were of desert locust.

A small swarm of *Loc. migratorioides* was observed on the 28th in the district of Uocchi (Carnescim).

On the 31st nuclei of reddish coloured desert locusts alighted on Monte Anzai to the south of Nacfa.

Other desert locusts, yellowish in colour, coming from the Digdigta flew towards Agambussa.

No egg laying was reported.

During January 1932 a single swarm of the tropical migratory locust (*Loc. migratorioides*) was reported in the eastern plain : on the 1st January the locusts which were of a reddish brown colour came from Mai Atal and after passing over the territory of the Damas flew in the direction of Agambussa.

In the second decade of the month the presence of unidentified hoppers was reported at Sceeb and at Mersa Taclai.

\* In this, as in the third chapter, the countries are arranged in French alphabetical order.

(1) Communication from the official correspondent of the Institute, Dr. A. DE BENEDICTIS, Chief of the Agricultural Bureau of Eritrea, transmitted by the Government of the Colony.

### United States of America: The Reappearance of Tobacco Downy Mildew in Georgia (1).

The past year (1931) is credited with being the warmest in the history of the United States Weather Bureau. January 1932 has also been exceptionally warm. For example, at Washington, D. C., there was an accumulated excess above normal of 420 degrees F for the month of January, equivalent to a daily excess of 13.4°F. It is then not surprising that certain diseases are appearing in February which normally appear in April or May.

As in the spring of 1931, special interest is being aroused by the appearance of the Downy Mildew, *Peronospora hyoscyami*, of tobacco this winter in the plant beds of Georgia. It will be remembered that during the months of March, April and May, 1931, the downy mildew of tobacco appeared in numerous plant beds from Louisiana to Maryland. While the actual commercial losses proved to be slight, the very rapid spread of the disease and the alarming appearance of the affected beds gave rise to a great deal of excitement. As will also be remembered this was the first appearance of the disease in the United States since the spring of 1921, when it was found in a few counties in Florida.

The earliest observed appearance of the disease this winter was reported by Dr. J. G. Gaines who found 20 per cent. of the plants in a seed bed at Tifton, Georgia, affected December 30, 1931.

During the past winter (up to February 15) there has been no killing frost in south Georgia. Due to the unusual warm weather tobacco seedlings in early plant beds grew rapidly and suckers from original stalks left unmolested in 1931 beds continued to grow.

Downy mildew was observed on two beds of young tobacco seedlings and on three of the 1931 discarded beds, during late January, and by February 13, numerous reports of the diseases had been received from various points throughout the Georgia tobacco belt.

### India: *Rhizoctonia bataticola* on Sorghum (2).

In continuation of the report on *Rhizoctonia bataticola*, which appeared in the September (1931) number of this journal (p. 163) it has now been definitely shown in controlled experiments that this fungus is pathogenic to sorghum under certain conditions of soil moisture. This parasite has caused this year considerable damage to *rabi* (winter) sorghum in the experimental plots at Mohol. The severe attack was probably due to the heavy quantities of late rains received early in December.

### India: *Sclerotium rolfsii* on Cotton in Bombay (2).

*Sclerotium rolfsii* has been recorded for the first time to be causing damage to cotton under field conditions in the Bombay Presidency.

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(1) Communication from the official correspondent of the Institute, Dr. Neil F. STEVENS, Senior Pathologist, Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington.

(2) Communication from the official correspondent of the Institute, Dr. B. N. UPPAL, Plant Pathologist to Government, Bombay Presidency, Poona.



Morocco (French Zone) : Movements of Swarms of *Schistocerca gregaria* (1).

Sous.

- 22 January 1932. — A brick red swarm coming from Tiznit alighted at Tiout, 20 km south-east of Taroudant.
- 23       "       " — The same swarm passed Aoulouz, 70 km east of Taroudant, flying north-east.
- 25       "       " — A large swarm (10 × 20 km) coming from the south passed the night 16 km to the south-east of Taroudant.
- 26       "       " — This swarm passed the night 74 km to the north-east of Taroudant.
- 27       "       " — A swarm of 2 × 3 km coming from the south-east alighted in the valley of the Sous 20 km west of Taroudant. Another 4 × 2 km coming from the south-west reached the Sous valley 30 km east of Agadir.
- 28       "       " — A somewhat dense swarm of 25 × 5 km flying north-west passed the night 30 km north-east of Taroudant.

UARZAZAT.

- 21 January 1932. — A large swarm alighted in the evening 70 km south-east of Taroudant. Part of this swarm flew away on the 22nd in a south-easterly direction.
- 23       "       " — A very large swarm alighted 75 km south-west of Ouarzazat.
- 24       "       " — Another swarm 80 km south-west of Ouarzazat; departed on the 25th towards the north-west.
- 29       "       " — A large swarm 10 km north-east of Taroudant.

GRAND ATLAS.

- 22 January 1932. — A large swarm 30 km east-north-east of Tamanar; departed on the 23rd towards the north. Another swarm, but not large, 26 km east of Tamanar; on the 3rd flew away in a northerly direction.
- 25       "       " — A large swarm passed Imintanout flying north-west.
- 27       "       " — A large swarm alighted 30 km north-west of Imintanout.
- 28       "       " — A sparse swarm alighted 35 km north-north-west of Imintanout. A red swarm of 4 × 3 km coming from the north alighted 30 km north-east of Tamanar and departed on the 29th towards the north-west.
- 29 30 31       "       " — A third swarm 26 km east of Tamanar, where it remained on the 29th and 30th; departed on the 31st towards the north-east.

CHAOUIA.

- 24 January 1932. — A red swarm of 1 × 1 km alighted in the evening 48 km south-east of Settât; departed on the 25th towards the north-east.

(1) Communication from Mr. P. RÉGNIER, Chief of the Crop Protection Service of Morocco (French Zone) at Rabat, transmitted to the Institute by Mr. DELASSUS, Crop Protection Inspector of Algeria and Chief of the Regional Locust Station at Algiers.

## TADIA.

- 23 January 1932. — A swarm coming from the south-west alighted 10 km north-east of Dar Ouled Zidouh.
- 24       "       " — This swarm passed Talaal Cheil, 20 km west-north-west of Beni Mella1, flying north. It alighted in the evening at 1 ½ km south of Boujouad ; departed on the 25th towards the south-west.
- 26       "       " — A small swarm coming from the south passed over Oued Zem and alighted 30 km north of this centre.
- 27       "       " — A swarm coming from the south-west alighted 10 km south-east of Moulay-bou-Azza.
- 28       "       " — This swarm flew away in a north-westerly direction.

## RABAT.

- 28 January 1932. — Pink, grey and yellow locusts coming from the south (Oued-Zem) alighted 15 km east of Camp Christian.
- 29       "       " — A swarm 20 km to the south-west coming from Moulay-bou-Azza flying north.

## VARIOUS QUESTIONS

## Freeing the Soil of Rooted Azaleas from Insects (1).

Importance of the question. — It is needless to insist here on the importance as regards technique as well as from the point of view of international horticultural commerce, of the problem of freeing the soil adhering to plant roots from insects.

The present study is principally concerned with the development of a process which will destroy as simply and economically as possible the larval or adult stages of the insects which may be met with in the soil about the roots of azaleas.

Recognised soil insecticides. — Among the compounds at present known carbon disulphide and hydrocyanic acid gas are found the most efficacious. Unfortunately the high toxicity to man of hydrocyanic acid gas makes its use very dangerous. Thus carbon disulphide retains the most important place among soil insecticides.

Carbon disulphide however presents certain disadvantages, viz, its action on plant foliage coming in contact with its vapour, its inflammability, its insolubility in water and its inadequate action against certain insects.

Leach and Flemming have invented a device for treating soil round roots with carbon disulphide while protecting the foliage from the vapour. To obtain this result the aerial parts of the plant are submerged in water during the treatment.

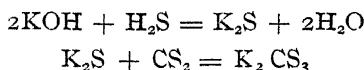
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(1) Communication from Dr. H. SCHEERLINCK, Inspector of Horticulture to the Ministry of Agriculture of Belgium, and Mr. N. CHARLERS, Ingénieur A. I. Gx., Chief of the Agricultural Research Laboratory of the Belgian Chemical Union, transmitted by the Minister of Agriculture of Belgium to the International Institute of Agriculture.

This method may be accused of being relatively complicated and still leaving unaltered the other drawbacks mentioned above.

Thus the writers have directed their research towards the derivatives of carbon disulphide and amongst these the sulphocarbonate of potassium has been found most worthy of attention.

The sulphocarbonate of potassium is obtained by the action of sulphuretted hydrogen and carbon disulphide on potash, according to the following equation :



The product thus obtained is very unstable ; in the presence of water and an acid it decomposes according to the following equation :—



In this decomposition a potassium salt of the acid used, carbon disulphide and sulphuretted hydrogen are produced. This last gas itself possesses notable insecticidal properties which are added to those of the carbon disulphide.

Moreover the residual potassium carbonate in addition to its nutritive value constitutes an alkaline dressing which may favourably modify soil reaction, neutralising partially or completely, according to the quantity used, any soil acidity.

In the dry state sulphocarbonate of potassium may contain 38 % of  $\text{CS}_2$  and liberate during decomposition 17 % of  $\text{H}_2\text{S}$ .

Sulphocarbonate of potassium is usually sold commercially in aqueous solutions titrating about 35 % of the dry product.

The use of sulphocarbonate of potassium for the control of insect pests of plants has been known for a long time ; it has been successfully used in France for the control of *Phylloxera vastatrix*. It is still recommended for this use by the Viticultural Research Station of Lausanne. According to instructions supplied to Swiss vine growers the most effective treatment consists in steeping the vine cuttings for a given time in a soapy solution to which 3 % of sulphocarbonate of potassium is added.

This method was the source of inspiration in the first experiments of the writers on the root soil of azaleas. But as will be shown below the process had to be abandoned owing to its seriously injuring growth in this case.

#### EXPERIMENTS.

Relative toxicity of carbon bisulphide and sulphocarbonate of potash.— With an equal content in carbon bisulphide a mortality of 14.6 % of cock-chaffer larvae (*Melolontha vulgaris*) was produced by an emulsion of carbon disulphide, against that of 31.1 % produced by sulphocarbonate of potash. Thus the latter appears to have double the insecticidal action of carbon disulphide emulsion.

Resistance of azaleas to steeping of the root clot in solutions of sulphocarbonate of potash. — These experiments were started on the lines recommended by the Lausanne Viticultural Research Station for the disinfection of vine cuttings.

Conclusions.— The steeping method gives good results as regards the killing of the larvae but also kills the plants.

**Injection process.** — The method of using the sulphocarbonate of potash was then modified. It was decided to inject the solution into the soil. A preliminary experiment with a Pravaz veterinary syringe having given encouraging results a small special apparatus was constructed.

This apparatus consisted of a 200 c. c. Pravaz syringe with certain modifications. The needle was replaced by a hollow tube drawn out to a point at one end. The point was not perforated, but 66 holes 1 mm. in diameter were made perpendicularly to the axis of the tube and in 3 different planes. The total length of the tube was 14 cm; the holes were distributed over a length of 10 cm. Between the needle and the pump was inserted a tube with two stopcocks, one of which was connected to a lateral tube by which the solution was drawn up into the pump, and the other when closed prevented particles of soil adhering to the needle from entering the apparatus.

To inject the solution in the pump into the soil it was only necessary to reverse the taps of the two stopcocks. The taps were protected against fouling by a small shield, 6 cm. in diameter, placed perpendicularly to the axis of the needle between it and the pump. The lateral tap could be connected by rubber tubing to the reservoir of solution to be injected.

This arrangement makes it possible to carry out a series of injections with great rapidity without having to clean the syringe.

**Resistance of azaleas to injections of sulphocarbonate of potash.** — In the first experiments a 100 c. c. unmodified Pravaz syringe was used. It was found that the optimum injection of the solution was not attained in this way.

The apparatus described was then used and 200 c. c. of solution were injected into each root clot of approximately 2 kg.

After injection the clots were soaked in water for 3-4 minutes to promote regular distribution of the disinfectant.

The clots with larvae were kept, as in the other experiments, in pots, and those without larvae in the ground.

The experiments with the improved syringe were repeated, injecting each clot with 200 c. c. of the sulphocarbonate solution.

#### GENERAL CONCLUSIONS.

**1st result.** — The azaleas were resistant to injections of solutions of sulphocarbonate of potash at 20 % and about 40 % of the larvae were killed with 5-10 % solutions. Other disinfectant solutions tried by the same method did not give similar results.

Control experiments were at the same time carried out with geraniums and vines in pots.

A first series of plants was watered with 5 %, 10 %, 15 % and 20 % solutions of sulphocarbonate of potash. Those treated with 5 % and 10 % solutions suffered no harm, those given 15 % and 20 % appeared to be killed. The mortality of the larvae was similar to that in the azalea experiments. If the percentage mortality of the insects is not yet adequate the reasons, as shown below, are the dryness of the soil and the use of insufficient solution.

Further experiments were tried with geraniums and vines in pots: — (a) by sprinkling and (b) by injection after previous moistening of the soil.

**2nd result.** — In the pots treated with 5 % solution all the larvae were killed and the geraniums uninjured. Similarly with the 10 % pots. In the 15 %

pots the larvae were killed but the plants were slightly scorched. In the 20 % pots the larvae were killed and the plants were killed.

The resistance of the vines not yet being determined the plants are being kept under observation.

After these experiments a further series of rooted azaleas were injected with 200 c. c. of sulphocarbonate of potash and then steeped in pure water for 5 minutes. The results of these new experiments were more encouraging as regards the mortality of the insects.

Other chemical substances for injection are under study for it is thought that in this direction must be sought a practical solution of the problem.

The disinfection of rooted azaleas and of soil is still far from being achieved, but certain conclusions may already be drawn from these investigations :—

(1) It has been proved that sulphocarbonate of potash is twice as toxic as a pure emulsion of carbon disulphide.

(2) New facts have been ascertained with regard to the resistance of azaleas, i. e., that they are able to withstand 10 % and more by the injection method.

(3) Larvae of *Cetonia stictica* are killed by a 5 % solution of sulphocarbonate of potash.

(4) Larvae of the striped click-beetle (*Agriotes lineatus*) are killed by a 7.5 %-10 % solution.

(5) *Otiorrhynchus raucus* is killed at 7.5 % and even at 5 % when they are buried at sufficient depth and their escape prevented.

(6) Larvae of *Sciara quinquelineata* are killed at a concentration of 1 % of sulphocarbonate of potash.

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## LEGISLATIVE AND ADMINISTRATIVE MEASURES

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**Guatemala.** — Plant protection measures in force in Guatemala require that any package containing plants or plant parts, seeds or fruits must be accompanied by a sanitary certificate endorsed by a consul of the country. Seeds and plants imported without such a certificate will be forwarded by the customs or post office to the Department of Agriculture which will if necessary have them disinfected. Flower or vegetable seeds sent through the post in small quantities do not require a sanitary certificate. It is forbidden to introduce slips of sugar cane, mulberry trees, seeds and plants of coffee, banana plants coming from the West Indies and the countries bordering the Gulf of Honduras, also sacks which have been previously used, with a view to preventing the introduction of the beetle *Araecerus fasciculatus*. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 155).

**Italy.** — A Ministerial Decree dated 16 February 1932 modifies the special technical regulations for the exportation of potatoes established by the Ministerial Decree of 23 February 1931, and establishes *inter alia* that by healthy tubers are intended those showing on the exterior surface no spots, traces of rot or other defects which spoil their appearance or indicate that the potatoes are unfit for consumption. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 2 marzo 1932, anno 73<sup>o</sup>, n. 51, pp. 1085-1086).

**Mexico (1).** — By 'acuerdo' of the 'Secretaría de Agricultura y Fomento' dated 4 December 1931, which came into force on the 9th of the same month, the 'Cuarentena Interior Núm. 4' for the purpose of preventing the spread of the 'mosca de la fruta' (*Anastrepha ludens*) has been modified and amplified.

In consequence of the serious damage this fruit fly has caused in the Republic the new text contains a series of regulations which aim at avoiding the spread of the pest in the zones already infested and its introduction into other regions of the country not yet infested.

**Portugal.** — The Head Customs Office in Lisbon has communicated a list containing the names of a dozen products for the control of plant diseases and pests which may be imported free of duty. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 389).

\* \* By Decree No. 20301 of 11 September 1931 there has been formed in expectation of the reorganisation of the Phytopathological Section of the Ministry of Agriculture, a permanent Commission for Plant Protection, which will be responsible for the sanitary control of importation and exportation, issue of sanitary certificates and the quarantine service for imported plants. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 87-88).

**Italian Somaliland (2).** — The Ministry of Agriculture and Forests on request of the Ministry for the Colonies has decided to allow, in derogation of the present regulations, the importation into the Kingdom of Italy of Solanaceous crop products (potatoes, peppers, egg plants and tomatoes) produced in the East African Colonies.

The conditions for safeguarding the agriculture of the country from possible infection by new parasites of plants, on which the Ministry has accorded permission for such importation, are the following :—

(a) Consignments of potatoes, tomatoes, egg plants and peppers produced in Eritrea and Italian Somaliland must be accompanied by sanitary certificates issued by the Colonial Phytopathological Service.

(b) On unloading in Italian ports the vegetables specified shall be inspected by officials of the Metropolitan Phytopathological Service and admitted for importation if certified free from harmful parasites.

(c) In the case of the vegetables being found infected with parasites they shall be thoroughly desinfected by the persons concerned.

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(1) Communication from the official correspondent of the Institute, Dr. Alfonso DAMPF, Jefe del Departamento de Investigación, Oficina Federal para la Defensa Agrícola, San Jacinto, D. F.

(2) Communication from the Government of Italian Somaliland.

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# INTERNATIONAL BULLETIN

## OF PLANT PROTECTION

1932

No. 4

### DISCOVERIES AND CURRENT EVENTS \*

#### Algeria : Desert Locusts (*Schistocerca gregaria*) (1).

- 10 February 1932 : A medium-sized swarm of red locusts was observed at Adrar, flying east.
- 11       "       "       A large swarm of red locusts coming from the west alighted 60 km to the south of Timimoun (Deldoul) and departed again on the 12th in an easterly direction.
- 11       "       "       A small swarm was reported 95 km south-east of Brezina flying east (Géryville).
- 12       "       "       A small swarm of red locusts coming from the south-east alighted at Ghardaïa and departed on the 13th towards the north-west.
- 14       "       "       Locusts on the ground reported at Sidi-Abdelkader 10 km north-east of Ouargla.
- 14-15   "       "       Large swarms of red locusts seen in the regions of Colomb-Béchar and Kenadza, flying from west to east.
- 17       "       "       Locusts reported at Guerrara, 80 km north-east of Ghardaïa.
- 25       "       "       A sparse swarm of red locusts alighted in the region south-west of Ouargla.
- 28       "       "       A large swarm reported at Hassi Ouallen, 30 km south-west of El-Goléa flying towards this post.

#### Cirenaica : Plant Pests (2).

*Earias chlorana* and *E. anthophilana*. Caterpillars of these two species have destroyed numbers of cotton bolls in the experimental plots of the Agricultural Services of Cirenaica.

*Acidalia fulminatella*. In the garden of the Agricultural Section of Derna the writer has found caterpillars of this moth on the flowers of *Dianthus Caryophyllus*.

*Phycita poteriella* and *P. fuscopilella*. The control of the *Phycita* of the castor oil plant presents no difficulties : spraying the foliage till it is brown with a weak solution of 'Urania' in 10 litres of water is very effective.

\* In this, as in the next chapter, the countries are arranged in French alphabetical order.

(1) Communication to the International Institute of Agriculture from the General Government of Algeria.

(2) Communication from the official correspondent of the Institute, Mr. Giorgio KRUGER, Entomologist, Royal Bureau for Agricultural Services of Cirenaica, Bengasi.

*Platyedra gossypiella*. Is new for Cirenaica. The writer has bred it from caterpillars obtained from cotton bolls coming from the experimental plots of Rahaba.

*Spalax aegyptiacus*. This rodent cuts the main roots of trees and shrubs at a depth of 30 centimetres or more. To begin with the damage escapes notice because the injured plant continues to grow for some time during the cold season. *S. aegyptiacus* does not hibernate in Cirenaica; it tunnels to a depth of two metres. At Sleaia, near Barce, where the damage to almond trees was considerable, the writer experimented against the live animals with whole wheat treated with 5 % of zinc sulphide, sodium arsenate and 'Urania'. The action of all these poisons was equally slow and effective, causing death after about seven hours. In consequence of these results control is being tried with the poisons; in the spring the experiments will be extended to include gases.

### Morocco (French Zone): Movements of Swarms of *Schistocerca gregaria* (1).

The bulk of the swarms of desert locusts which were massed in the region of Tamanar and Gloua flew east and invaded the districts of East Marrakech, Azilal, Demnat and Tadia.

A few small swarms reached Mamora and 25 km N. W. of Meknès but caused no serious damage.

On 15 February two small swarms alighted in the territory of Agadir 22 km S. E. of Tamanar.

In the region of Marrakech a swarm which had alighted on 16 February in the Ourika, 40 km S. E. of Marrakech, on the 18th came to ground at Tamesiout, 36 km S. E. of Marrakech.

A sparse swarm passed over Demnat on the 18th flying east.

In the Tadla a swarm coming from the west alighted on the 16th 20 km east of Dar Ould Zidouh.

In the Gharb two very dense but small swarms alighted on the 17th, one 7 km east of Kénitra, the other 7 km S. E. of Kénitra, and remained during the 18th.

In the region of Meknès a small swarm coming from the east alighted on the 17th 32 km N. W. of Meknès.

The swarm reported 40 km S. E. of Marrakech alighted on the 19th at Djebel Tasserimont, 34 km S. E. of Marrakech. Catching was taken in hand.

A swarm reported 35 km S. E. of Marrakech was completely destroyed on the 21st by cold and rain.

In the region of Mogador a small red swarm alighted on the 21st 16 km north of Tamanar.

The swarms previously reported in the vicinity of Kénitra moved east on the 23rd and alighted at Sidi Yahia, Gharb, covering 40 sq. km. Copulation began.

A swarm of little importance passed the night of February 21-22 at Ouled Smail, 10 km S. W. of Kasbah-Tadla, and flew N. E. on the 23rd.

In the region of Azilal a large swarm alighted in the Antifa tribe, extending 16 km west, 23 km east and 36 km north of Azilal.

On 24 February a swarm coming from El Kansara passed 16 km to the south of Sidi Slimane.

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(1) Communication from Mr. P. RÉGNIER, Chief of the Crop Protection of Morocco (French Zone) at Rabat, transmitted to the Institute by Mr. DELASSUS, Crop Protection Inspector of Algeria and Chief of the Regional Locust Station at Algiers.



In the region of Azilal a large swarm remained on the 24th 25 km N. E. of Azilal and was practically wiped out by bad weather.

The swarms previously reported at Sidi Yahia circled about this centre and its neighbourhood on the 24th, causing serious damage.

In the region of Tamanar a swarm of  $6 \times 4$  km coming from Ida ou Tanant alighted on the 23rd 26 km south of Tamanar.

In the region of Mogador a red swarm alighted on the 21st 28 km E. S. E. of Mogador and departed east on the 22nd.

Another swarm on the same date alighted 16 km north of Tamanar.

In the region of Azilal a swarm coming from the S. W. alighted on the 26th at Tisgui, Aït Attab, 26 km north of Azilal.

In Tadia a very small swarm alighted on the 26th 6 km S. E. of Sidi Lamine.

In Gharb the swarm reported previously at Dar bel Hamri flew on the 25th towards Koebia, passing over the valley 14 km S. W. of Sidi Slimane.

In the region of Marrakech the swarms reported 13 km N. E. of Demnat moved their position and alighted on 25 February 12 km N. W. of this centre.

In Sous some swarms remained from 22 to 26 February 40 km N. E., 36 km N. E. and 20 km N. E. of Taroudant and caused damage to the olive plantations.

In the region of Mogador a swarm of  $3 \times 1$  km alighted on 26 February 24 km south of Mogador and the next day 22 km S. S. E. of this locality.

In the region of Marrakech a swarm of  $4 \times 2$  km alighted on the 28th 34 km south of Marrakech and stayed there on the 29th. The swarms reported 12 km N. W. of Demnat alighted 5 km to the north and 3 km W. S. W. of the locality.

A large swarm alighted on the 28th 26 km N. W. of Azilal.

In Tadia a swarm of  $5 \times 2$  km alighted on the 28th 24 km east of Boujad.

In the region of Mogador a red swarm of  $6 \times 4$  km alighted on the 28th 14 km south of Tamanar.

A small pink swarm alighted the same day 26 km S. E. of Mogador and was kept to the ground by bad weather.

In the region of Marrakech a swarm alighted on 28 February 10 km west of Demnat; a second 20 km west of Demnat; a third 23 km N. W. of Demnat; this last flew on the 29th. On 24 February a small swarm alighted 28 km west of Demnat.

The swarm reported at Tisgui, Aït Attab, 26 km N. W. of Azilal, moved to 24 km west of Azilal and 17 km W. S. W. of Azilal.

In Tadia a swarm coming from the west alighted on the 29th in the evening 28 km E. S. E. of Dar Ouled Zidouh.

In Gharb the swarms reported remained in the same places and eggs were deposited over the whole border of the Mamora between El Menzeh (10 km S. W. of Sidi Yahia) and El Tleta (2 km south of Sidi Yahia).

Collecting was actively carried out.

### Italian Somaliland: Desert Locusts (*Schistocerca gregaria*) (1).

During the last quarter of 1931 the Colony was invaded by dense swarms of locusts, from Rocca Littorio as far as Afmadu.

On 20 October the first swarm was reported from Belet Uen, coming from the north-west and flying south-east.

(1) Communication from the official correspondent of the Institute, Dr. R. GUDOTTI, Chief of the Agricultural Bureau of Italian Somaliland, transmitted by the Government of the Colony.

On 1st November a great quantity of locusts came to ground in the region between Bardera and Gioheren and departed shortly afterwards towards the south-west.

On 2 and 3 November locusts were reported in the regions of Merca, Audegle and Afgoi ; these swarms came from the north and were flying south.

Others were reported the same day at Dolo and at Lugh, flying towards Bardera. On the 5th laying began in this locality and along the caravan route Galadi-Dudub-Dagaria (Commissariat of Mudug).

Other swarms coming from the west and flying north-east passed over the regions of Alessandra and Baidoa. At Baidoa the flight of the swarm lasted two hours and was then dissipated by a heavy shower and violent wind.

The following day other swarms flying south passed over Oddur ; laying was reported near Genale and on the right bank of the Scebeli in the region of Corvodea.

From the Residence of Afmadù it was reported on 7 November that from information received it appeared that the adjoining territory of Kenya was also invaded by locusts.

On the 10th swarms flying east and coming from the west passed over Alessandra and Gelib.

On 11 November laying was reported in the dunes between Merca and Vittorio d'Africa, and on the 12th large swarms coming from the north-east and flying south-west.

Hatching began the same day in the region to the north of Mahaddei.

Laying occurred also on 13 November at Afgoi Addo and at Bulu Burti, and on the 23rd hatching began in the district of Genale.

From 23 to 27 December swarms flying north-east passed over the localities of Far Uama, Margherita and Gelib. On 29 December the right bank of the Giuba was invaded in the vicinity of Margherita by large swarms which alighted on the native 'sciambe' and caused serious damage to the maize crops and then flew in the direction of Gelib which they passed over during the morning of the 30th, continuing their flight along the river.

The Commissariats and Agricultural Centres endeavoured with the means at their disposal to combat the invasion. By edicts and continual and repeated orders to the chiefs and important natives the native population was convinced of the absolute necessity of control measures and satisfactory results were thus obtained.

## LEGISLATIVE AND ADMINISTRATIVE MEASURES

**Germany (1).** — The Ordinance of 23 February 1932, with the purpose of preventing the introduction of the Colorado beetle (*Leptinotarsa decemlineata*) from France, prohibits importation and transit of potatoes, tomatoes, aubergines, strawberries, plants with roots covered or not covered with soil, tubers, bulbs, rhizomes

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(1) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

and all other subterranean parts of plants, and of peelings or other waste material of these products, of sacks or any other object which has been used for packing or preserving these products.

Also during the period from 15 March to 14 November of each year importation and transit of fresh vegetables and other such plants, of the aerial parts of plants, with the exception of fruits, are allowed only subject to the following conditions :

(a) these products must have grown at a distance of at least 200 km from the limits of the territory infested by the Colorado beetle ;

(b) each package must be accompanied by a sanitary certificate conforming to the model annexed to the present Ord. issued by an official of the French Phytopathological Service and stating that the products contained in the package have been inspected and found free from the Colorado beetle and that they fulfil the conditions specified in paragraph (a).

**France.** — In view of the risks to plantations of fruit and forest trees from the importation into France of the San Jose scale (*Aspidiotus perniciosus*), the presence of which has just been found in Paris on fruits coming from the United States of America, a Decree of 8 March 1932 provides as follows :—

Art. 1. — The entry into and transit in France of living plants and parts of living plants, including fresh fruits, trees and shrubs, nursery garden products, cuttings and other plant parts, originating and coming from the United States of America, are forbidden.

The same applies to other countries in which the presence of the San Jose scale has been ascertained :— Australia, Canada, China, Japan, New Zealand.

This applies also to cases, sacks or other packings serving or having served to transport the above-mentioned objects.

Art. 2. — Importation into France of fresh fruits coming from countries other than those specified in Art. 1 is authorised only if the consignments are accompanied by a statement from the competent authority of the country of origin indicating the place of production.

Art. 3. — Decrees from the Minister of Agriculture will indicate if need arises the countries other than those mentioned in Art. 1 above to which the prohibition prescribed in the Article shall apply.

Art. 4. — By modification of the prohibition prescribed in Art. 1 the following may be authorised :—

(1) Importation of certain classes of fruits treated in the country of origin in such a way as to ensure that they are not carrying *A. perniciosus* ; such importation being effected only in the conditions and by the custom offices fixed by Decree of the Minister of Agriculture in consultation with the ' Comité consultatif des Epiphyties ' ;

(2) Importation of living plants, parts of living plants and fresh fruits intended for study and research, having a permit issued by the Minister of Agriculture, who will arrange the conditions on which such importation may be permitted. •

Art. 5. — The Decree of 30 November 1898 relating to *A. perniciosus* is hereby annulled. (*Journal Officiel de la République Française*, Paris, 9 mars 1932, LXIV<sup>ème</sup> année, n° 58, p. 2526-2527).

**\*\*** By Ministerial Decree of 15 March 1932 importation of consignments of potatoes grown in zones contaminated with the Colorado beetle [*Leptinotarsa decemlineata*] or in protection zones is authorised subject to the following conditions :—

(1) That the tubers are healthy, clean and have been properly graded and cleaned in the farm buildings, cellars or storehouses ;

(2) That the consignments shall be inspected by the Plant Protection Service. The potatoes may be loose, in cases or in sacks; the packings must be clean and in good condition.

Potatoes picked in fields where the presence of the Colorado beetle has been reported as also potatoes rejected at the time of sorting may not in any circumstances be conveyed outside the contaminated or protection zones.

This regulation concerning the transport of potatoes is applicable during the period beginning 1st October of each year and terminating on 15th May of the following year, unless any alteration of the dates is prescribed by Ministerial Decree in case of exceptional circumstances.

Exportation of potatoes grown in the contaminated or protection zones remains strictly prohibited. (*Journal Officiel de la République Française*, Paris, 16 mars 1932, LXIV<sup>ème</sup> année, n<sup>o</sup> 64, p. 2735).

\* \* A Ministerial Decree of 15 March 1932 provides as follows:—

Art. 1. — Entry into France of fresh fruits grown in and coming from the countries specified in Art. 1 of the Decree of 8 March 1932 is authorised subject to the following conditions:—

(1) That the said products are accompanied by a certificate of sanitary inspection issued by the competent authorities of the country of origin guaranteeing absolutely that the fruits are not carrying the San Jose scale [*Aonidiella pernicios*];

(2) That sanitary inspection shall be effected on arrival by an inspector of the Plant Protection Service who will accord free right of entry if the fruits are found healthy or if not will order their destruction or return.

Art. 2. — Citrus fruits are admitted into France until further order on the presentation of a sanitary certificate in accordance with Art. 1 of the present Ministerial Decree.

Art. 3. — The transit of the fresh fruits specified above is forbidden in a loose state but allowed in packages such as boxes, barrels, sacks, cartons or other similar packages.

Entry into and transit in France of these fruits may take place only by the ports of Havre, Bordeaux, Marseilles, Dunkerque, and by the custom office of Paris.

*Temporary measures applicable to fresh fruits in storage or transit at the moment of publication of the Decree of 8 March 1932.*

Art. 4. — All fresh fruits other than apples and pears, are admitted without special inspection and without the certificate specified in Art. 1 of the present Ministerial Decree.

Apples and pears presented in small cases and in paper wrappings coming from the United States (Washington, Oregon and California) are admitted without formalities. Similar products coming from the United States (Virginia, West Virginia, New York, New Jersey) are admitted subject to sanitary inspection on arrival.

Apples and pears presented in any other packages are admitted subject to sanitary inspection on arrival.

Fruits found to be contaminated will be destroyed or returned at the expense of the importer. (*Ibid.*, p. 2735-2736).

**Italy.** — The Royal Decree Law No. 197 of 19 March 1932 gave full and entire effect to the Convention of Commerce and Navigation between Spain and Italy settled at Rome on 15 March 1932.

'The High Contracting Parties covenant not to impede in any way the mutual trade of the two countries by any prohibitions or restrictions of importation, exportation or transit'. Exceptions to this regulation, in so far as they are ap-

plicable to all countries or to countries in similar conditions, may be allowed only in the cases specified in Art. 7 of the Convention, *inter alia* 'in consideration of sanitary policy and in view of the protection of animals and useful plants against diseases, insects and harmful parasites, and particularly in the interests of public health and in conformity with the international principles adopted on this subject'.

It being understood that this regulation in so far as it concerns importation into Italy of Spanish bananas shall be interpreted in the sense that the sanitary policy of Italy shall be exercised within the limits and under the terms and rulings of the International Convention for Plant Protection signed at Rome on 16 April 1929 [see this *Bulletin*, 1929, No. 4, pp. 50-55].

The Convention of Commerce and Navigation between Spain and Italy came into force provisionally on 30 March 1932. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 26 marzo 1932, anno 73<sup>o</sup>, n. 71, pp. 1426-1434; 29 marzo 1932, n. 73, p. 1488).

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# INTERNATIONAL BULLETIN

## OF PLANT PROTECTION

1932

No. 5

### DISCOVERIES AND CURRENT EVENTS \*

#### French North Africa : Swarms and Laying of *Schistocerca gregaria* (1).

##### ALGERIA.

- 2 March 1932 — Swarm at Guerrara (Ghardaïa).  
4 " " — A large swarm of red locusts passed over Beni-Ounif flying from N. to S.  
" " " — A somewhat dense swarm of brown locusts passed flying N. to S. between Colomb-Béchar and Kenadza.  
9 " " — Swarm at Guerrara (Ghardaïa).  
13 " " — A large swarm coming from the west alighted near Beni-Ounif (Djenan Adrar) and departed on the 14th in an easterly direction.  
14 " " — A small swarm of brown locusts alighted near Ain-Sefra.  
" " " — Swarm of  $1 \times 0.5$  km coming from the south alighted 35 km east of Brézina (Géryville).  
17 " " — A sparse swarm alighted 12 km west of Brézina (Géryville).  
21 " " — A large swarm coming from the east alighted 1 km from Frendi (Beni-Ounif).  
22 " " — Ghardaïa reported a swarm in the Oued Madagh el Kebir.  
23 " " — A small swarm of red locusts passed near Ain-Sefra flying from west to east.  
23 " " — Taghit reported a large swarm on the ground 30 km north of the post.  
" " " — Meridja reported copulating locusts 20 km S. W. of the post.  
" " " — Small swarm 30 km S. W. of Messad flying N. W.  
24 " " — Ghardaïa reported a swarm 8 km north of the post.  
30 " " — Tébéssa reported large swarms coming from the south laying in the region of Bir bou Habeline.  
" " " — Small swarm on the ground at Oued Dermel (Ain-Sefra).  
31 " " — El Oued reported swarms and laying along the El Oued Nefta.

##### TUNIS.

- 1 March 1932 — Dark red swarm flying from S. W. to N. E. at Bordj Lehcœuf.  
" " " — Dark red swarm 40 km S. E. of Kebili.

\* In this, as in the third chapter, the countries are arranged in French alphabetical order.

(1) Communication from the General Government of Algeria to the International Institute of Agriculture.

- 2 March 1932 — Swarms flying from S. to N. at 20 km. and 70 km. S. of Takahouine.
- 4   "   "   — Large swarm 30 km in breadth 35 km S. W. of Médenine.
- "   "   "   — A swarm of 1 sq. km alighted 30 km W. S. W. of Matmata.
- 10   "   "   — Swarm 43 km W. S. W. of Tozeur.
- 11   "   "   — Further locusts coming from the S. W. and W. swelled the swarms remaining west of Tatahouine and laid.
- 12   "   "   — The swarm reported 30 km W. S. W. of Matmata laying.
- 14   "   "   — A large swarm 5 km. in length alighted 30 km. S. E. of Matmata.
- "   "   "   — Three swarms, two of which were small, were reported near Médenine; copulation occurred.
- 15   "   "   — The swarm reported on 10 March 43 km W. S. W. of Tozeur laying.
- "   "   "   — Swarms scattered about the region west of the post of Matmata. Copulation occurred.
- 16   "   "   — A large swarm coming from the west alighted 2 km from Kebili.
- 17   "   "   — A large swarm alighted in the region of Matmata.
- "   "   "   — Swarms reported 42 km S. W. of Kebili towards the Algerian frontier.
- 18   "   "   — Laying observed 2 km south of Matmata.
- "   "   "   — A swarm alighted 15 km east of Matmata.
- 19   "   "   — A swarm alighted 70 km S. W. of Gabès. Copulation. Some laying.
- "   "   "   — A small swarm alighted 60 km S. S. E. of Ben Gardane.
- 20   "   "   — Extensive laying 30 km S. E. of Matmata. Swarm 30 km. west of Médenine.
- 21   "   "   — A swarm of  $3 \times 1$  km. coming from the west alighted 50 km S. W. of Gabès.
- "   "   "   — Laying observed 65 km west of Gabès.
- "   "   "   — A swarm passed 35 km west of Gabès flying from E. to W.
- "   "   "   — A swarm alighted 65 km S. E. of Ben Gardane and departed towards the east.
- 22   "   "   — A small swarm alighted 15 km S. W. of Ben Gardane and was destroyed.
- 23   "   "   — A swarm of medium size coming from the S. W. alighted 43 km S. S. E. of Gabès.
- "   "   "   — A swarm coming from the S. W. alighted 22 km S. W. of Ben Gardane.
- 24   "   "   — Laying 15 km S. W. of the post of Ben Gardane.
- 25   "   "   — A small swarm coming from the S. W. alighted 25 km N. W. of Gabès and was destroyed.
- "   "   "   — Laying occurred from 20 March 60 km east of Gabès.
- 26   "   "   — A swarm coming from the west alighted 23 km W. S. W. of Ben Gardane.
- "   "   "   — Laying reported 65 km S. of Ben Gardane.
- 27   "   "   — A swarm coming from the N. E. on the ground 32 km S. of Ben Gardane.
- 28   "   "   — A swarm coming from the south alighted 30 km N. E. of Kebili.



- 28 March 1932 — A swarm alighted 40 km south of Gabès.  
 » » » — A swarm coming from N. W. alighted 25 km N. W. of Tozeur.  
 » » » — Laying reported 30 km N. E. of Kebili.  
 » » » — Laying 20-30 km. south of Ben Gardane.  
 30 » » — A swarm coming from N. W. alighted 20 km east of Médénine.

MOROCCO.

- 3 March 1932 — A swarm, from the S. E. alighted 54 km E. N. E. of Bou Denib.  
 » » — A swarm alighted at Tamanar (Mogador).  
 » » » — A small swarm alighted 24 km E. of Dar Ould Zidouh (South Chaouïa).  
 7 » » — A very dense swarm of  $14 \times 6$  km alighted near Mogador.  
 » » » — Two swarms reported 32 km and 26 km E. of Mogador.  
 » » » — A swarm of 4 km departed from the vicinity of Demnat (Marrakech) towards the N. N. E.  
 » » » — A swarm alighted 18 km S. E. of Dar Ould Zidouh (South Chaouïa).  
 » » » — A small swarm alighted 14 km W. of Beni Mellal.  
 » » » — A swarm alighted 18 km E. S. E. of Boujad.  
 » » » — A dense swarm stopped 23 km N. of Demnat.  
 » » » — Part of a large swarm from the south alighted 16 km N. E. of Mogador.  
 » » » — A medium-sized swarm 24 km S. E. of Mogador.  
 8 » » — A large swarm passed 22 km west of Sidi-Slimane.  
 » » » — A swarm 23 km N. of Demnat departed in a westerly direction.  
 » » » — Three swarms alighted 26, 30 and 32 km E. and S. E. of El Kelan (Marrakech).  
 9 » » — Two swarms alighted 15 km N. E. of Demnat (Marrakech).  
 » » » — Several small swarms 28 km and 9 km S. W. of Tamanar (Mogador).  
 » » » — Two swarms alighted 12 and 30 km E. of Dar Ould Zidouh (Tadla).  
 10 » » — Swarms from the region of Gharb departed towards the north 12 km N. N. E. of Sidi Yahia.  
 » » » — Laying 7 km S. W. of Sidi Slimane.  
 12 » » — A swarm of  $4 \times 2$  km coming from the Sous alighted 30 km S. W. of Argana and departed on the 13th in southerly and north-westerly directions.  
 13 » » — Swarms in the region of Azilal departed towards the N. E.  
 » » » — Laying 25 km S. S. W. of Dar Ouled Zidouh.  
 » » » — A yellow swarm laying 14 km S. E. of Dar Ouled Zidouh.  
 » » » — Swarm 8 km N. E. of Kasbah-Tadla.  
 14 » » — Swarm 18 km E. N. E. of Kasbah-Tadla.  
 » » » — Copulating locusts over 1000 ha. to the west of Sidi Himane.  
 15 » » — A swarm of 21 sq. km. alighted 11 km E. of Kasbah-Tadla.  
 16 » » — A swarm of 5 sq. km. alighted 26 km W. S. W. of Petit Jean.  
 17 » » — Laying 16 km N. E. and 24 km S. E. of Mogador.  
 » » » — Laying over 4 sq. km at 40 km W. N. W. of Petit Jean.  
 » » » — Laying 9 km E. S. S. and 12 km E. of Mogador.  
 » » » — A swarm alighted 10 km S. W. of El Kelaa.

- 18 March 1932 — A swarm of  $8 \times 15$  km alighted 6 km S. E. of Safi and departed towards the S. W.
- » » » — A swarm alighted 56 km N. E. of Taroudant.
- 19 » » — Two swarms flew east of Boujad and Tadla.
- 21 » » — A fair-sized swarm passed over Petit Jean going west.
- » » » — A somewhat dense swarm came to ground 26 km N. W. of Azizal.
- » » » — A red swarm of  $5 \times 2$  km coming from N. W. alighted 20 km E. of Kasbah-Tadla.
- » » » — A swarm of 10 sq. km alighted 9 km E. S. E. of Petit Jean flew 22 km to the S. W. Copulation.
- » » » — A swarm alighted 25 km S. E. of Kelaa.
- » » » — Laying over 800 ha 100 km E. of Agadir.
- 22 » » — Laying 25 km S. E. of Kelaa.
- » » » — A swarm 10 km E. S. E. of El Kelaa.
- » » » — Laying over 10 ha. 10 km S. E. of Sidi Slimane.
- » » » — Laying over 300 ha. 29 km E. S. E. of Mogador.
- » » » — A swarm of  $2 \times 2$  km alighted 16 km S. S. E. of Kasbah Tadla; departed on the 23rd towards the N. E.
- » » » — Laying over 10 ha. 3 km S., over 10 ha. 17 km, over 5 ha. 16 km S. S. E. of Biougra (Sous).
- 23 » » — The swarm reported on the 19th at 11 km E. of Tadla departed towards the S. W.
- » » » — A swarm covering 100 ha alighted 16 km from Beni Mellal.
- » » » — A swarm 28 km S. of Safi departed on the 24th towards the N. E.
- » » » — Laying at 12 km N. E., 16 km N. N. E. and 20 km N. of Tadla.
- » » » — Laying over 2000 ha. 20 km N. W. of Taroudant; 200 ha 40 km E. S. E. of Agadir.
- » » » — Laying over 2 sq. km at 6 km and 1 km S. W. of Petit Jean.
- » » » — Swarms at 24 and 34 km N. E. of Taroudant flying west.
- » » » — Laying over 1 sq. km at 5 km E. of Petit Jean.
- » » » — Laying at 13 km S. W. of Sidi Slimane.
- » » » — Swarm of  $5 \times 2$  km at 30 km N. E. of Imouzar.
- » » » — Swarm of  $7 \times 3$  km at 20 km N. of Tamanar.
- 24 » » — Two dense swarms near Taroudant.
- » » » — Laying over 300 ha 10 km W. of Tamanar; over 10 ha 27 km S. S. W. of Tamanar.
- » » » — Two swarms of  $5 \times 2$  km and  $3 \times 2$  km alighted 16 km and 25 km N. W. of Demnat.
- » » » — Two swarms at 5 and 15 km N. E. and E. of Petit Jean.
- » » » — A swarm 20 km N. of Tamanar departed towards the N. E.
- » » » — A small swarm alighted 16 km N. E. of Demnat.
- » » » — Laying over 450 ha. 12 km E. of Mogador; over 200 ha 42 km S. of Safi.
- 25 » » — A swarm of  $3 \times 2$  km coming from the north alighted 38 km S. E. of El Kelaa, then flew N.
- » » » — A small swarm alighted 17 km N. W. of Demnat. Copulation.
- » » » — A swarm alighted 20 km N. of Demnat.
- » » » — Laying over 200 ha 28 km E. of Taroudant; over 500 ha. 15 km E. of Tadla; over 1000 ha in the farms around Petit Jean.

- 26 March 1932 — Swarms from the vicinity of Demnat departed towards the west and alighted 16 km W. of Demnat.
- » » » — A swarm of 4 sq. km alighted 17 km S. E. of Tadla and departed towards the N. E.
- » » » — Laying over 1000 ha. 17 km N. E. of Taroudant ; over 3 ha 54 km S. E. of Safi ; at 16 km N. W. and 25 km N. W. of Demnat.
- 27 » » — A swarm of 4 sq. km alighted 50 km S. of Safi.
- » » » — A swarm of 3 × 3 km alighted 20 km S. E. of Tadla.
- » » » — A swarm of 5 sq. km alighted 20 km S. of Tadla.
- 28 » » — Swarms 40 km S. E. of Mogador.
- » » » — A medium swarm passed 25 km S. E. of El Kelaa flying east.
- » » » — Locusts on the ground 30 km E. of Dar Ouled Zidouh.
- » » » — Swarms from 12 km S. E. of Petit Jean alighted 34 km E. N. E. of Petit Jean.
- 29 » » — Laying over 5000 ha 30 km N. E. and over 20 ha 38 km N. E. of Taroudant.

**Eritrea : Desert and Tropical Migratory Locusts (*Schistocerca gregaria* and *Locusta migratorioides*) (1).**

During February 1932 there have been no reports of laying or hatching of eggs. No locust swarms have passed over the Colony.

All along the Red Sea Coast, particularly at the entry of streams, small groups of *Schistocerca gregaria* and *Locusta migratorioides* belonging to the solitary phase have been reported.

During March 1932 no swarms, laying or hoppers were reported in the Colony.

**United States of America : Some Diseases of Small Fruits (2).**

In several localities of the Atlantic Coast diseases of small fruits were more serious during 1931 than other recent years.

Dr. A. N. Brooks reported from Florida that an average of only 50 per cent. of the strawberries picked this season in the Hillsborough and Polk County sections had been packed out for shipping. The highest percentage was about 70 per cent. and following heavy rains, only 20 to 25 per cent. were packed out. He attributed 90 per cent. of the trouble directly or indirectly to cold weather and excessive rainfall.

There was widespread lack of pollination which resulted in deformed berries. Examination of blossoms disclosed lack of pollen in many, and in others the pollen was not released. Another effect of cold weather was a lengthening of the period between blossoming and ripening of fruit from the normal three or four weeks to five or six weeks, while fruit buds continued to push out at about the usual rate. This resulted in an abundance of potential fruit on the plants, a single plant often carrying from 100 to 200 green berries. The fruit from such plants was of small size.

(1) Communication from the official correspondent of the Institute, Dr. A. DE BENEDICTIS, Chief of the Agricultural Bureau of Eritrea, transmitted by the Government of the Colony.

(2) Communication from the official correspondent of the Institute, Dr. Neil E. STEVENS, Senior Pathologist, Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington.

Dr. R. F. Poole reported that in 1926, 1927, 1928 and 1929, anthracnose of dewberries was of minor importance in the Sandhill region of North Carolina. In 1930 there was a minor infection of the berries, but a definite increase in infection of leaf and cane on *Lucretia* dewberries. During 1931 the disease was of major importance. A very large portion of the crop was destroyed or became unprofitable. As far as can be judged from their reports, the condition in 1931 corresponds closely with that noted by Wolf and Dodge in 1925.

The Massachusetts cranberry crop, which comprises about three-fourths of the cranberry crop of the United States, showed an unusual loss from rot in 1931. The keeping quality was undoubtedly poorer than that of 1922, and in the opinion of some observers, was inferior to the notorious crop of 1914. An idea of the relative amount of loss from decay during recent years may be gained from a comparison of the average amount of decay in storage lots from representative bogs in Plymouth County during the last four years as shown in Table I. The figures given are for the condition on November 15 when the fruit had been in storage approximately two months. Similar differences appeared on October 15.

The Early Black is the most important variety, and makes up approximately half the total production. The Howes is second in importance and is the standard late variety. Eight to ten lots were stored for each variety.

Table I. — Average condition of test storage lots of cranberries expressed as percentage of rotten berries, November 15.

Variety	Percentage Rotten November 15			
	1928	1929	1930	1931
Early Black . . . . .	7.4	11	13.1	31
Howes . . . . .	6.5	9	6.7	14
Odd varieties . . . . .	12.2	18	15.6	30.5

The condition of the crop is apparently correlated with unusually high temperatures in May and June combined with an unusual number of rainy days in July and August. This combination of weather conditions has occurred only four times in the last twenty years, in 1914, 1919, 1922, and 1931, all years in which the crop showed poor keeping quality.

## VARIOUS QUESTIONS

### Discussions of the Committee for the Study of Locust Biology at Algiers (1).

The Committee for the Study of Locust Biology (C. E. B. A.), which was established by the VIIth North African Conference, met at Algiers, January 21-23, 1932. The principal discussions are reported as follows:—

(1) Communication to the International Institute of Agriculture from the Government General of Algeria (Direction des Services Economiques).

Executive organisations attached to the C. E. B. A. — The Delegates agreed to appoint as executive bodies (Inter-Centres) the Crop Protection Services or, where such do not exist, the Government Departments specially concerned. The Regional Station of Algiers was in accordance with the provisions of the Rome International Convention of 31 October, 1920 adopted as Permanent Centre.

It is understood that any organisation which has carried out research on locust biology may on request become a corresponding body under the C. E. B. A.

Functions assigned to the executive bodies of the C. E. B. A. — The Inter-Centres shall communicate to Algiers the information they receive. The Permanent Centre in Algiers will undertake to distribute the communications, in the full text if required, to bodies interested and in particular to the Ministry of Colonies in Paris, the Sheriffian Scientific Institute, the International Centre for Locust Biology and to the International Institute of Agriculture at Rome, to this last being obligatory in virtue of the Rome Convention of 31 October 1920.

The Committee expressed a wish that the International Institute of Agriculture should undertake the entire distribution of the documents.

International Centre for the Study of Locust Biology. — Resolutions 2 and 6 of the International Meeting held at Rome, September 28 to October 1, 1931 on the initiative of the British and Italian Governments, [see this *Bulletin*, 1932, No. 1, p. 8] were read.

All the Delegates were agreed in recognising that the Imperial Institute of Entomology in London should be chosen as the International Centre for the Study of Locust Biology.

Relations with the International Centre for the Study of Locust Biology. — The Committee passed the following resolution:—

‘The C. E. B. A. expresses the wish:—

(1) That the International Centre in London shall agree to keep the Committee informed of the results of its activities ;

(2) That the International Centre in London shall publish annually and forward to the Committee a bibliographical analysis of all that has been published on locust questions, including both biology and control’.

Uniform action of the countries represented. — The following passage was read from the report presented by the Director of the Economic Services of the Government General of Algeria:— ‘The major migratory species of locusts *must show certain biological resemblances and complete knowledge of the life cycle of one may greatly facilitate study of the others*; also seeing that their geographical area of distribution overlaps, the work of a research party in a given place will be of general interest whatever was the principal point of study. All research and survey work must thus be undertaken jointly by all the States represented on the C. E. B. A., *even if any one of them has nothing to fear from some particular species*’.

The Committee is of the opinion that it is necessary that action should be on uniform lines and the representatives of each country of French Africa are prepared to work on this principle.

Participation of countries not represented on the C. E. B. A. — The Committee considers that Togoland and the Cameroons should be asked to send representatives in an advisory capacity to future meetings.

Meteorology. — The Committee is unanimous in affirming the fundamental importance of this question. It is considered indispensable for the prelim-

inary documentation to obtain detailed information on the system of meteorological posts at present existing in the region to be studied and the Committee would prefer to receive the information in the form of maps showing the position of each post and its composition. As regards Algeria, Morocco and Tunis such information may be obtained from the competent Service of each country. For French West Africa and French Equatorial Africa M. Henri Hubert, General Inspector of the Colonial Meteorological Services at the Ministry of Colonies may be asked to supply the information. The Committee would be pleased to receive the reports already completed summarising the meteorology of French Africa and in the future to receive monthly reports such as those established by the Meteorological Service of Algiers. The Director of the Economic Services of the Government General of Algeria may request the Algerian Meteorological Service to supply the material in its possession concerning studies carried out in French Africa. In addition to monthly reports the Committee would be glad to be supplied with more detailed information should occasion arise.

Biological study of the minor migratory locusts.— With reference to the Moroccan locust (*Dociostaurus maroccanus*) the Committee is of the opinion that it would be of considerable importance to ascertain whether in the zones where the species is endemic in Algeria and Morocco the phenomenon of the phases suspected in the East may also be found. Such a study might be a useful contribution to that of the major migratory locusts. The Committee considers on the other hand that it would be useless to carry out a similar study of the Italian locust (*Calliptamus italicus*), its zone of endemic occurrence being very limited in North Africa.

#### General scheme of enquiry.

(a) Necessity for a single enquiry. — The following passage from the report quoted above was read:— 'It is essential to avoid the dispersion of information which seems to have brought to nothing the separate efforts of the bodies which have undertaken locust research. With this purpose a resolution must be formulated requesting the 'Commission Nationale d'Etude des Calamités', which has already asked for assistance in the Colonies now linked up on the C. E. I. A., to rely on this organisation which would then alone carry on the investigations'.

After discussing the question the Committee decided that by 'single enquiry' should be understood that carried out by a single authority, by a single organisation issuing instructions to official or voluntary observers and receiving from them the information collected.

As regards French Africa the Committee understands that it itself constitutes this authority. It will carry out the single-enquiry and the Crop Protection Service at Algiers will be its executive body. The Committee further recognises:—

(1) 'That it is understood that the interchange of information already being effected between countries in accordance with the Rome Convention of 1920 shall be continued as in the past ;

(2) 'That if certain organisations such as the Ministry of Colonies and 'Commission des Calamités', desire to receive information the Committee shall supply them with its documentation'.

(b) Previous invasions. — The study of the beginning of the invasion making it possible to locate the permanent breeding zones of the migratory species the Committee recommends:—

(1) That Governments having collected information on previous invasions should provide for an enquiry of this order covering the years up to 1927 inclusive which will be of value for the future work of the Committee ;

(2) That the Crop Protection Service at Algiers shall undertake this enquiry and prepare invasion maps which will make it possible to illustrate the matter received '.

(c) Questionnaire. — The following questionnaire was drawn up as a result of the discussions :—

## QUESTIONNAIRE

### I. — OBSERVATIONS ON THE PASSAGE OF MIGRATORY SWARMS.

- (1) Locality.
- (2) Distance and direction in relation to a fixed point on a map (scale 1: 2 000 000)
- (3) Geographical position (latitude and longitude).
- (4) Date and hour.
- (5) Direction of flight.
- (6) Predominant colour of locusts: pink, red, yellow or brown.
- (7) Weather conditions :  
     Predominant wind.  
     Temperature.  
     Effects of sudden changes of weather on the locusts (rain, storm, fall in temperature, etc.).
- (8) Conditions coincident with the settling of the swarm (hour, change of weather, attraction by crops, etc.).
- (9) What plants, wild or cultivated, have been attacked and which avoided by the locusts.

### II. — OBSERVATIONS ON LAYING (PRIMARY SWARMS).

- (1) Locality.
- (2) Date.
- (3) Direction from which locusts arrived (primary swarm).
- (4) Weather conditions (particularly rainfall during the days (about a week) preceding the beginning of laying.
- (5) Description of breeding grounds :  
     (a) Position (slopes, valleys, banks of waterways, etc.).  
     (b) Quality of soil chosen (texture and moisture content).  
     (c) Nature of vegetation.

### III. — OBSERVATIONS ON EGGS AND HATCHING.

- (1) Situation and extent of land on which eggs are found.
- (2) (a) Date of first laying.  
     (b) Date of hatching of first hoppers.  
     (c) Date of hatching of last hoppers.
- (3) Weather conditions (specially rain) from laying till end of hatching (changes of weather such as sudden rains, rise or fall of temperature, etc., should be noted).

### IV. — OBSERVATIONS ON HOPPERS.

- (1) Locality and date of observations.
- (2) Date of hatching of first hoppers.
- (3) What plants are eaten by hoppers, what plants are avoided (differences on this point may exist among hoppers at different ages).
- (4) Are there present hoppers of abnormal colouring, particularly green or brown? If so, in what approximate proportion to those of normal colouring (black and yellow).

### V. — OBSERVATIONS ON ADULTS HATCHED LOCALLY (SECONDARY SWARM).

- (1) Locality and date of observations.
- (2) Notes, if required, on primary swarm in cases where there is no doubt on the parentage of the secondary swarm observed.
- (3) Dates on which all the individuals of the new swarm show wings and become yellow.
- (4) Date on which the locusts begin to fly.
- (5) Date and direction of departure of new swarm.
- (6) Plants eaten by secondary swarm.

# VI. — MISCELLANEOUS INFORMATION.

Collect native sayings, customs, superstitions, etc., concerning locusts in all stages of development. Native names should be noted, whether of locusts in general or particular species.

(d) *Correspondents*. — Apart from the official correspondents to which the Governments on request of the Committee will give precise directions, the Committee will address questionnaires to the following voluntary correspondents:— estate managers, teachers, missionaries, who will be provided with printed addressed envelopes to be posted free of charge.

(e) *Maps*. — Although the international map of Africa on a scale of 1 : 2 000 000 is inadequate for recording the number of indications obtained during a carefully observed invasion, the Committee considers that it will suffice for documentation purposes.

(f) *Conventional signs*. — The Committee adopts those decided on by the International Meeting at Rome, 28 September-1 October 1931 [see this *Bulletin*, 1932, No. 1, p. 10].

(g) *Specimens*. — The Committee considers the forwarding of specimens of special importance. It was decided that specimens of adult locusts may be killed by immersion in very hot water, quickly dried, enclosed in paper envelopes or put in cardboard tubes closed with wadding and sent as rapidly as possible in suitable packages. Eggs and young hoppers however should be sent only in pure or denatured alcohol. In each case the colour of the living animal should be noted previously. The Committee considers that to facilitate the work of the senders they should be provided with suitable means of packing.

Each sample should be accompanied by labels inside and outside indicating (a) locality, (b) time of capture, (c) the reference number borne elsewhere on the correspondence, the questionnaire or other report concerning the specimen. The Committee requires that the samples shall be addressed direct to the Centre at Algiers by the collectors and that free postage shall be granted throughout French Africa, authorised by a special label. These are the only indications absolutely essential.

*Meetings of the C. E. B. A* — In accordance with the suggestions of the Government General of Algeria, adopted by the VIIth North African Conference, the C. E. B. A. shall meet as often as the successful progress of its work requires and at least once each year, before the sessions of the North African Conference.

The Committee decides to meet before the International Meeting for Locust Control that is to be held in Paris in July 1932 on the occasion of the Vth International Entomological Congress, in order to report on its work to the Delegates of the various Governments.

*Publications of the C. B. E. A.* — The Committee will publish reports of its meetings, its recommendations to the Governments and the reports that it receives from the research parties.

*Research parties*. — The Committee is of opinion that for the following reasons there is need to send a party this year, in October for example, into the regions about Ségou, San and Timbuktu:—

(1) The Central Locust Committee has just sent a party into Nigeria. It also proposes to send a party to the region specified if the French Government does not accept the offer of collaboration formulated in the 7th Resolution of the International Meeting in Rome [see this *Bulletin*, 1932, No. 1, p. 8].

(2) The region indicated may, according to information already collected, be regarded as definitely possessing the two migratory species which are most



important for French Africa, the tropical migratory locust (*Locusta migratoria*) and the desert locust (*Schistocerca gregaria*);

(3) Specimens sent to the experts include transitional forms which indicate that this region is important for the study of the phases;

(4) The date of departure may be quickly arranged as there is complete security and means of transport are fully assured in the regions concerned.

The Committee considers that the British Government should be requested to appoint an English entomologist to accompany the French expedition.

The Committee in view of the various difficulties in the way of survey work in Spanish Rio de Oro, which however is of primary importance for the study of the invasions of Morocco and Western Algeria by the desert locust, desires to call the attention of the Governments to these matters.

As regards the sending of parties into Mauritania and Oubanghi-Chari-Tchad, which were under consideration at the VIIth North African Conference, the Committee is of opinion that a report on the question should be made at the next meeting.

Staff of the Permanent Centre of the C.E.B.A. — In consideration of the very considerable work involved in the collection and examination of documents by the Crop Protection Service of Algiers the Committee is of opinion that the extra expenditure on the necessary specialised staff and equipment should be charged on the total credit of 1 500 000 francs agreed to by the last North African Conference.

General motion. — The Committee being aware of the difficulties of all sorts involved in the biological study of locusts, difficulties relating to the long distances, the enormous extent of the zones for survey, the scarcity of meteorological and pedological documentation in the zones, and more particularly to the very difficult nature of the biological problem itself, desires to call the attention of the higher authority to the necessity of prolonging the studies and to their probable long duration. It is desirable that the Government, public opinion and its chosen representatives and the press should be informed on this point and should refrain from any undue desire for speed such as might tend to discredit or discountenance this international enquiry.

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## LEGISLATIVE AND ADMINISTRATIVE MEASURES

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**Cuba.** — In virtue of the 'resolución' of 12 December 1931 exporters of fresh plant produce must apply to the 'Sección de Sanidad Vegetal', at least 24 hours in advance of the time arranged for packing, for the visit of an inspector who must examine the produce and will authorise shipment only of that which complies with the prescribed sanitary conditions and is of commercial value. To his request for inspection every exporter must attach the receipt for the sum paid to the 'Pagaduría de la Secretaría de Agricultura, Comercio y Trabajo' in payment of the charge for inspection in the given hours of working and non-working days based on the tariff contained in the present 'resolución'. (*Revista de Agricultura, Comercio y Trabajo*, Órgano Oficial, Habana, Cuba, 1932, año XIII, núm. 7, pág. 49).

**Spain.** — By Decree of 18 February 1932 exportation of potatoes is authorised by all the customs offices of the Republic provided that they comply with the following conditions :—

Potatoes intended for exportation shall be free from all kinds of insects, insect larvae and eggs, also from any cryptogamic disease regarded as harmful to the crops of the importing country.

The customs offices will authorise exportation of consignments only when these are accompanied by a certificate issued by the Inspection Service of the respective Agronomic Sections. (*Gaceta de Madrid*, Madrid, 19 febrero 1932, año CCLXXI, tomo I, núm. 50, págs. 1228 a 1230).

**France.** — By Ministerial Decree of 8 April 1932 the prohibition contained in article 1 of the Decree of 8 March 1932 [see this *Bulletin*, 1932, No. 4, p. 57] relating to measures for preventing the introduction into France of the San José scale (*Aspidiotus perniciosus*) is applicable to consignments coming from Argentina, South Africa, the Hawaiian Islands and Mexico.

Article 4 of the Decree of 15 March 1932 [see this *Bulletin*, 1932, No. 4, p. 58] relating to temporary measures is cancelled. (*Journal Officiel de la République Française*, Paris, 13 avril 1932, LXIV<sup>ème</sup> année, n° 87, p. 3984).

\*\*\* By Decree of 18 April 1932 from the date which will be fixed by the Minister of Agriculture, the importation and transit of potatoes, tomatoes, aubergines, living plants, tubers, rhizomes, bulbs of all sorts and fresh vegetables are forbidden in France if coming from Great Britain, Germany or the Netherlands.

Importation into France of potatoes coming from Spain is forbidden in the same conditions. As an exception to this importation of seed potatoes coming from the above-named countries may be authorised by Decree of the Minister of Agriculture. (*Ministère de l'Agriculture. Direction de l'Agriculture. Bulletin de l'Office de Renseignements Agricoles*, Paris, 1<sup>er</sup> mai 1932, année 1932, n° 9, p. 193).

\*\*\* By Ministerial Decree of 18 April 1932 the provisions of the Decree of 18 April 1932 came into force as from the day of publication in the *Journal Officiel* (20 April 1932). (*Ibid.*, p. 196).

\*\*\* By Ministerial Decree of 18 April 1932 the exceptional importation of seed potatoes allowed by the Decree of 18 April 1932 may be effected without previous authorisation when the potatoes are accompanied by a certificate conforming to the model annexed to the present Ministerial Decree and issued by the official authorities of the country of origin and provenance of the potatoes, stating that the latter are selected seed, *i. e.*, that they were grown and harvested in accordance with normal genetical procedure under the control of skilled geneticists. The certificate must also state that the consignments are free from diseases and parasites. (*Ibid.*, p. 196-197).

**Italy.** — By Law No. 185 of 8 February 1932, the Royal Decree-Law No. 799 of 12 June 1931 (see this *Bulletin*, 1931, No. 9, p. 166) concerning the reduction of the trade tax on fertiliser and anti-cryptogamic materials directly utilisable in agriculture to 0.50 liras per cent, has been made law. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 23 marzo 1932, anno 73°, n. 68, p. 1371).

\*\*\* The Royal Decree Law No. 242 of 19 March 1932 gives full and entire effect to the commercial 'Modus vivendi' between Italy and France signed at Rome on 4 March 1932.

In accordance with Art. 6 of this Agreement the High Contracting Parties reserve in all circumstances the right to prohibit or restrict importation and exportation of merchandise for reasons of sanitary policy in order to ensure the protection of man, animals or plants against diseases or parasites, all provision to this effect being equally applicable to any other countries in similar conditions. This Agreement came into force on 4 April 1932. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 2 aprile 1932, anno 73<sup>o</sup>, n. 77, pp. 1567-1588; 4 aprile 1932, n. 78, p. 1618).

\*\*\* With a view to avoiding any hindrance or delay in the foreign exportation of Italian potatoes, by Circular No. 235 of 12 March 1932 the Ministry of Agriculture and Forests communicated to the Directors of the Royal Phytopathological Observatories the regulations now in force in European countries (Germany, Czechoslovakia, Yugoslavia, Austria, Denmark, England, Belgium, Sweden, Norway, Luxemburg, France and Switzerland) regarding importation into their respective territories of Italian potatoes. (*Bollettino Ufficiale del Ministero dell'Agricoltura e delle Foreste*, Roma, 1<sup>o</sup> aprile 1932, anno IV, n. 7, pp. 903-908).

**Mexico.** — On 21 December 1931 was instituted the 'Cuarentena Interior Núm. 6' with the purpose of preventing the spread of the disease of bananas caused by *Fusarium cubense* and commonly known as 'mal de Panamá' (Panama disease) and as 'mancha del plátano' in certain parts of the Republic.

All the banana growing regions of the country are declared 'zonas de control'. There are at present 14 of these zones, each with precise boundaries. Three are subjected to total quarantine, the percentage of the disease being over 30 %; three are in partial quarantine, the amount of disease being less than 10 %; in the remaining eight which are declared free from infection the necessary precautions will be taken to avoid introducing the disease.

Any owner or holder of any banana plantation whatever within the zones of control must immediately inform the 'Oficina Federal para la Defensa Agrícola' or its representatives of the presence of the disease and put into force the special regulations ordered in each case by the 'Oficina' in order to prevent the disease spreading.

A series of measures regulates transport of any part of the banana plant, with the exception of the fruit, within and from the zones of control subjected to total or partial quarantine.

A permit from the 'Oficina' is required before planting bananas in any region of the Republic. Any new plantation must be made with 'semilla' coming from a non-infected zone and whose origin is certified by the 'Oficina' or its representatives. In the zones subjected to total quarantine banana plantations may be planted only with varieties known to be resistant to or immune from the disease.

By the end of five years plantations of varieties considered susceptible to Panama disease must be eradicated from the zones in total quarantine.

In all the zones of control already defined and any which may later be formed will be instituted a Committee which will be responsible for superintending the control campaign against Panama disease in close collaboration with the 'Oficina'.

Violation of the regulations is punishable under various legislative provisions. (*Diario Oficial*, México, 13 de enero de 1932, tomo LXX, núm. 10, págs. 3 a 5).

**New Zealand.** — By special order, made by the Otahuhu Borough Council on 19 November 1931 and published by the Minister of Agriculture on 16 December 1931, the following plants are declared to be noxious weeds within the jurisdiction

of the Otahuhu Borough Council:— *Lycium horridum*, *Berberis vulgaris*, *Cryptostemma calendulaceum*, *Melianthus major*, *Psoralea pinnata*, *Galega officinalis*, *Rubus phoenicolasius*, *Lantana Camara*, *Echium plantagineum*, *Thlaspi arvense*, *Opuntia* (any species), *Leycesteria formosa*, *Linaria vulgaris*, *Solanum auriculatum*, *Anthemis Cotula*, *Convolvulus arvensis* and *C. sepium*. (*The New Zealand Gazette*, Wellington, December 24, 1931, Numb. 96, p. 3593).

**Peru.** — By 'resolución' of 19 November 1931 the sugar cane plantations of the valleys of the Rimac and Carabayllo have been declared infested by *Metamasius hemipterus*; consequently the removal of cane cuttings from these valleys, intended either for planting or consumption in other valleys of the Republic or for the general market, is forbidden. (*La Vida Agrícola*, Lima, 1932, vol. IX, no. 98, pág. 50).

**Portugal.** — The Decree No. 20535 of 6 November 1931 gives new regulations concerning importation of potatoes.

It is forbidden to import potatoes from countries having no well-organised Phytosanitary Service, also to import potatoes from America. Each consignment of potatoes intended for importation shall be accompanied by a certificate issued by the official Phytosanitary Service of the exporting country stating that wart disease (*Synchytrium endobioticum*) and Colorado beetle (*Leptinotarsa decemlineata*) do not occur in the country of origin either at the place or within 5 and 50 km respectively of the place where the potatoes were grown. The importer must inform the headquarters of the Phytosanitary Service six days in advance of any consignment of potatoes intended for importation, indicating the quantity, place of origin and place of entry.

The official responsible for inspection must open and verify at least 5 % of the bags or boxes. The least presence of wart disease will prevent importation. Consignments which shall contain more than 5 % of potatoes infected with *Phytophthora infestans*, *Spongospora subterranea*, *Actinomyces Scabies*, with other fungi or bacteria, with *Phthorimaea operculella*, or which are injured or damaged by frost will not be admitted for importation. Consignments which shall contain the least trace of wart disease or of the Colorado beetle, or whose certificates do not fulfil the requirements will be thrown overboard or burnt or, on request of and at the expense of the importer, will be returned to the consigner.

Whenever the official responsible for inspection shall refuse to import a consignment he must report the fact to the headquarters of the Phytosanitary Service, which, if it is considered advisable, will bring the matter to the attention of the Phytosanitary Service of the exporting country recommending greater care.

The importer must contribute to State funds 0.01 *escudo* for every kilo of potatoes imported. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 171-172).

**Sweden.** — By Royal Order of 16 October 1931 certain phytosanitary facilities have been accorded for the importation of living plants and plant parts coming from Germany. The conditions are that in each case a certificate shall be presented stating that the exporting firm is subject to constant inspection by the German Phytopathological Service and that such inspection shall not have revealed any plant disease or pest whose presence would in accordance with Swedish law prevent importation. If the plants or plant parts come from fields, nurseries or pots containing heath or peat soil importation will be allowed if the said certificate gives detailed information regarding the absence of all risk of infection by potato wart disease [*Synchytrium endobioticum*]. (*Deutsches Handels-Archiv*, Berlin 1932, 86. Jahrg., S. 273-274).

**Yugoslavia.** — By an Order of the Minister of Agriculture which came into force on 24 December 1931 apples and pears will be submitted to phytopathological control on importation even if they are accompanied by a sanitary certificate issued by the exporting country. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin 1932, 12. Jahrg., Nr. 2, p. 16).

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*Catantops pinguis*, *Podagria pallidicolor*, *Dysdercus nigrotarsatus*, in Eritrea; *Scapsipedus marginatus*, *Schizonychia*, *Anomala*, *Opatropsis blairi*, *Rhytidonota stupida*, *R. anguicollis*, *Pycnodactylus mitis*, *Coptotermes sjöstedti* var. *subinfectus*, *Svagrus rugiceps*, *Cyrtacanthacris tatarica*, *Prodenia litura*, *Cosmophila erosa*, *Xanthodes graellsii*, *Spilosoma investigatorum*, *Sylepta derogata*, *Acrocercops bifasciata*, *Pulvinaria jacksoni*, *Ferrisia virgata*, *Empoasca facialis*, *Chloridea obsoleta*, *Diparopsis castanea*, *Platyedra gossypiella*, *Mometa zemodes*, *Pyrodercus coriacea*, *Argyroploce leucotreta*, *Callidea drezei*. in Italian Somaliland].

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I. Die wirtschaftliche Bedeutung der Schädlingsbekämpfung. — II. Uebersicht der hauptsächlichsten Erkennungssymptome bei Pflanzenbeschädigungen. — III. Die Bedeutung der Insekten im Haushalt der Natur und insbesondere ihr Nutzen und Schaden. — IV. Die verschiedenen durch Insekten verursachten Beschädigungen an Pflanzen und ihre Auswirkungen. — V. Natürliche Faktoren, welche die Vermehrung der Insekten beeinflussen. — VI. Mortalität bei Insekten, sowie die Bedeutung des Klimas und Nahrungsraumes für die Vermehrung von Insekten. — VII. Die Entstehung der Insektenvermehrungen (Epidemiologie). — VIII. Die verschiedenen Ursachen der Beschädigungen an Pflanzen und Vorräten von Gütern des täglichen Bedarfs. — IX. Die verschiedenen Methoden der Schädlingsbekämpfung. — X. Uebersicht der wichtigsten Schädlinge und ihre Bekämpfung. — XI. Uebersicht über die allerwichtigsten Pflanzenkrankheiten und ihre Bekämpfung. — XII. Der deutsche Pflanzenschutzdienst. — XIII. Rat und Auskunfterteilung in Schädlingsbekämpfungsangelegenheiten. — XIV. Die Abteilung für Schädlingskunde im Frankfurter Zoologischen Garten. — XV. Optische Hilfsmittel. — XVI. [Literatur-Uebersicht].

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[*Fusarium culmorum*, *F. nivale*].

# INTERNATIONAL BULLETIN

## OF PLANT PROTECTION

1932

No. 6

### DISCOVERIES AND CURRENT EVENTS \*

#### French North Africa : Desert Locusts (*Schistocerca gregaria*) (1).

##### ALGERIA.

- 1 April, 1932. Large swarms in the desert regions of the Commune of Kenchela.  
The swarm which alighted on March 30th in the region of Négrine departed towards N. W.
- »   »   » Laying over 1000 ha in the Négrine region.
- 2   »   » Laying 10 km S., 80 km S. E., 30 km S., 40 km S. S. E. of Ouargla.
- 3   »   » A swarm coming from the S. W. alighted 10 km S. of El Goléa.
- 4   »   » The swarm which alighted 10 km S. of El Goléa departed flying E.
- 5   »   » A small swarm at Ourlal (Biskra).
- »   »   » A swarm coming from the E. alighted 2 km N. of Kanga Sidi Nadji (Kenchela).
- 6   »   » A small swarm alighted at Sfisifa (Ain-Sefra).
- »   »   » Large swarms settled at Taberdga and Aliennas in the Commune of Kenchela.
- 7   »   » A swarm alighted 42 km N. E. of Ghardaïa.
- »   »   » Swarm reported at Larsane (Laghouat).
- »   »   » A swarm 28 km E. of Brezina.
- 8   »   » A swarm 42 km N. E. of Ghardaïa.
- »   »   » A small swarm settled at El Goléa and departed at night flying E.
- »   »   » Very extensive laying at Taberdga (5000 ha), and over 2500 ha in the desert regions of the Commune of Kenchela.
- 9   »   » A small swarm reported at Kimmel (Arris).
- »   »   » A small swarm coming from the W. alighted 80 km S. E. of Messad (Djelfa).
- »   »   » Laying in the Oued el Arab and Beni Barbar valleys (Kenchela).
- 10   »   » A small yellow swarm coming from the E. passed Zeribet el Oued (Biskra).
- »   »   » A swarm coming from the E. reported at Kimmel (Arris).
- »   »   » Swarm coming from the S. laid at Kimmel (Arris) and departed towards the S.
- »   »   » A swarm alighted 28 km E. of Brezina and departed towards N. E. after copulation.
- »   »   » A swarm alighted 80 km S. E. of Messad, departing again towards S. E.

\* In this, as in the following chapter, the countries are arranged in French alphabetical order.

(1) Communication from the Government General of Algeria (Direction des Services Economiques) to the International Institute of Agriculture.

- 11 April, 1932. A yellow swarm at Chegga (Biskra). Copulation.  
 » » » A swarm passed over Ain Naga flying towards N. (Biskra).  
 » » » A swarm coming from the N. alighted and laid at Liana (Biskra).  
 12 » » A large swarm alighted at El Goléa.  
 » » » A large swarm at M'Chounèche (Arris).  
 13 » » A swarm alighted at El Goléa on the 12th and departed towards N. E.  
 » » » A small yellow swarm alighted at Sfisifa (Ain-Sefra).  
 » » » Laying at El-Goléa.  
 » » » Laying at Saâda (Biskra).  
 » » » Laying at Tadjmout (Arris).  
 14 » » A small swarm coming from the S. W. alighted at Korchina (Mecheria).  
 » » » Hatchings 54 km N. E. and 65 km N. E. of Ghardaïa.  
 15 » » A swarm alighted in the Filiache region (Biskra).  
 » » » A red swarm coming from the W. alighted 90 km S. W. of Touggourt.  
 » » » Small layings to N. E. of El-Oued Annexe.  
 16 » » A swarm alighted 90 km S. W. of Touggourt and departed towards the E.  
 » » » A large swarm alighted 90 km N. of Touggourt (M'Ranier) flying from the E.  
 » » » A large swarm alighted 60 km N. W. of Touggourt (M'rara) coming from the S.  
 17 » » A swarm 25-35 km S. of Biskra flying towards S.  
 » » » A swarm 16 km S. E. of Touggart coming from the W. departed towards the S.  
 » » » A swarm reported at Ouled Abdi (Arris) flying towards S. W.  
 » » » The swarm which arrived at M'raïer on the 16th, departed flying N.  
 » » » The swarm at M'rara (Touggourt) departed flying W.  
 » » » A swarm coming from the S. reported at Zellatou (Arris).  
 » » » Laying at Tadjmout (Arris).  
 » » » Laying at M'Chounèche (Arris).  
 18 » » Swarm in the region of Kadoussa (Bou-Denib).  
 » » » A swarm alighted in the region of Filiache (Biskra).  
 » » » A swarm flying from the S. W. alighted at El-Outaya (Mac-Mahon).  
 » » » A swarm passed over Branis flying from S. to N.  
 » » » A fairly large swarm flying from E. to W. at El-Arriane, 70 km N. of Touggourt.  
 » » » Laying at Oulache and M'Chounèche (Arris).  
 19 » » Swarm coming from the S. reported at Chir (Arris).  
 » » » Some laying observed at Zab Cherghi (Biskra).  
 » » » Laying at El Outaya (Mac-Mahon).  
 20 » » Swarm coming from the E. reported at Kimmel (Arris).  
 21 » » Copulating locusts 80 km S. S. W. of Ghardaïa.  
 » » » A yellow swarm alighted at Selga (Biskra).  
 » » » A swarm at Kimmel.  
 » » » Hatchings at Bir Khafech (El-Oued).  
 22 » » A swarm which alighted at Selga (Biskra) departed towards the N.  
 23 » » Laying 88 km E. N. E. of Ghardaïa.  
 » » » Hatching 15 km S. of Guerrara and in the desert regions of Kenchela.

- 24 April, 1932. A swarm 136 km to S. E. of Ghardaïa.  
 » » » Hatching at Bou-Noura, Chaat Aïtboul, El-Ateuf (Ghardaïa).  
 25 » » Hatching 70 km W. of Ghardaïa.  
 » » » Hatching at El-Ateuf (Ghardaïa).  
 26 » » A swarm coming from the W. alighted 11 km S. of Ghardaïa.  
 » » » Swarm coming from the N. 27 km from Touggourt.  
 26 » » A large swarm from the S. alighted 40 km to the S. W. of Touggourt.  
 27 » » A swarm which settled 27 km N. of Touggourt departed towards the S.  
 » » » A swarm 40 km S. W. of Touggourt laid and departed towards the N.  
 28 » » Hatching at El-Ateuf (Ghardaïa).  
 29 » » A swarm alighted 11 km S. of Ghardaïa and departed towards the N.  
 » » » Swarm 40 km N. E. of Ghardaïa.  
 » » » Hatching 40 km from Ghardaïa.  
 30 » » Single hoppers were observed at Boghar, Boghari, Aïn Bessem, Oued-Marsa (strong wind) and Reibell (strong wind).

## MOROCCO.

- 1 April, 1932. A circling swarm 58 km S. S. E. of Safi. Laying.  
 » » » Swarm 8 km  $\times$  6 km settled 21 km from Azizal. Laying.  
 » » » A swarm alighted 44 km N. W. of Fez.  
 » » » Laying 4 km N. W., 8 km N. N. E., 30 km S. S. W., 35 km S. W. of Tamanar.  
 » » » Laying over 142 ha 22 km to S. E., 100 ha 21 km to S. E. 1200 ha 25 km. to E. N. E., 2200 at 21 km to E. N. E. of Mogador.  
 2 » » A large swarm 19-22 km N. of Azizal.  
 » » » A swarm of copulating locusts over 4-8 km N. N. W. of Sidi Slimane.  
 » » » Laying over 200 ha, 48-56 km S. S. W. of Safi.  
 3 » » Laying over 100 ha 65 km S. S. W. of Safi.  
 » » » Laying over 800 ha 64 km N. E., 200 ha 40 km E. N. E., 300 ha 8 km E. N. E., 400 ha 28 km E. N. E. of Taroudan.  
 4 » » A swarm laying 40 km S. W. of Immouza (Agadir).  
 » » » Laying over 250 ha in the Tribu Ida ou Tanant (Atlas).  
 » » » Laying over 4000 ha 25 km S. W. of Tamanar.  
 » » » Extensive laying 20-22 km from Azizal (N.-W. sector).  
 » » » Laying 17 and 20 km from Tiznit.  
 5 » » Laying over 300 ha 11 km E., 200 ha 16 km E. N. E., 15 ha 13 km N. of Taroudan.  
 6 » » A swarm settled 20 km N. E. of Azizal.  
 » » » A swarm settled 28 km N. N. E. of Azizal. Laying.  
 » » » A swarm alighted 27 km E. N. E. of Dar Ouled Zidouh. Laying over 200 ha.  
 » » » A small swarm alighted 31 km N. W. of Meknès.  
 » » » Laying over 60 ha 18 km N. of Meknès.  
 8 » » A yellow swarm alighted 37 km S. E. of Safi.  
 » » » A swarm of 2 sq. km alighted 2 km N. E. of Demnat.  
 9 » » A small swarm alighted 8 km N. W. of Fez.  
 » » » A large swarm alighted 22 km N. W. of Fez.  
 » » » Laying 2 km N. E. of Demnat.

- 9 April, 1932. Laying over 1000 ha 26 km E. N. E. of Mogador.  
 » » » Laying continues at Azizal.  
 » » » Hatching 12 km N. E. of Mogador.  
 » » » Hatching 8 km W. of Sidi Slimane (Gharb).  
 10 » » Laying over 4 ha 33 km S. E. of El Kelaa.  
 » » » Laying over 8 ha 14 km W. of Demnat.  
 12 » » Swarms alighted 19 km to S. E., 31 km to S. E., 20 km to S. S. E. and 28 km to S. E. of El Kelaa des Igharnas.  
 » » » Laying over 150 ha 33 km N. E. of Mogador.  
 13 » » A swarm alighted 24 km S. of Tamanar.  
 » » » A swarm of  $6 \times 11$  km passed, flying N. 45 km W. of Chichaoua.  
 » » » A swarm of 1 sq. km 18 km E. of Ait Ourir (Marrakech).  
 » » » A swarm 30 km E. S. E. and 33 km S. E. of El Kelaa.  
 » » » A swarm 14 km W. of Demnat.  
 » » » Laying over 300 ha 24 km S. of Tamanar.  
 » » » Laying over 2 ha 18 km E. of Dar Ouled Zidouh.  
 14 » » A sparse swarm alighted over 50 km, 29 km to the W. of Demnat.  
 » » » Laying over 400 ha at El Kelaa.  
 » » » Laying over 200 ha, 12 km E. S. E. of Dar Ouled Zidouh.  
 15 » » A swarm alighted 45 km S. of Safi.  
 » » » A swarm 18 km from Ain Ourir (Marrakech) departed towards N. W.  
 » » » Swarms alighted 24-16-26 km S. E., 34 km S., 28 km E. S. E. of El Kelaa.  
 » » » Hatchings 12 km S. W., 8 km S. W., 12 km S., and 19 km S. of Sidi Slimane (Gharb).  
 16 » » A swarm of 2 sq. km coming from the N. alighted 31 km W. S. W. of Demnat.  
 » » » Laying over 220 ha 15 km N. of Tamanar.  
 » » » Laying over 840 ha 35 km E. N. E. of Mogador.  
 17 » » A swarm alighted 26 km S. of Chichaoua.  
 » » » A very large swarm alighted 34-42 km N. W. of Telouet (Marrakech).  
 » » » A swarm 29 km W. of Demnat.  
 » » » Laying over 60 ha 26 km S. of Chichaoua.  
 » » » Laying over 100 ha 31 km W. S. W. of Demnat.  
 » » » Laying over 1500 ha 40 km N. W. of Telouet (Marrakech).  
 » » » Laying 34 km W. S. W. of Demnat.  
 » » » Laying 34 km S. S. E. of El Kelaa.  
 » » » Hatchings 26 km E. and 18 km N. W. of Taroudant.  
 18 » » A large swarm alighted 28 km N. E. of Bou Denib.  
 » » » A swarm 20 km N. of Zerecktene.  
 » » » Laying 20 km N. E. of Tamanar.  
 » » » Laying over 600 ha 15 km S. of Tamanar.  
 » » » Laying over 1600 ha in the vicinity of Kasbah Tadla.  
 » » » Hatching 11 km W. and 12 km W. S. W. of Tamanar.  
 » » » Hatching 10 km S. and 12 km S. of Sidi Slimane.  
 19 » » A swarm 17 km E. of Kenitra.  
 » » » Laying over 250 ha and 800 ha 18 km from Zerecktene.  
 » » » Hatching 27 km N. W. of Demnat.  
 » » » Hatching 12 km N. N. W. of El Kelaa.  
 » » » Hatching 30 km N. E. of Taroudant.  
 » » » Marching hoppers 5 km W. of Sidi Yahia (Gharb).

20 April, 1932. A swarm alighted 20-29 km W. of Demnat and departed towards the W.

- » » » Laying over 300 ha at Aït Amira (Tiznit).
- » » » Laying over 150 ha 14 km N. W. of Zerecktene.
- » » » Laying over 200 ha 6 km S. of Aït Ourir.
- » » » Laying over 200 ha 8 km S. E. of Aït Ourir.
- 21 » » A swarm 20 km N. E. of Tamanar.
- » » » Laying over 50 ha 25 km N. E. of Zerecktene.
- » » » Laying over 50 ha 18 km N. N. W. of Zerecktene.
- » » » Laying over 50 ha 20 km N. E. of Tamanar.
- » » » Laying over 150 15 km N. N. W. of Zerecktene.
- » » » Laying over 100 ha 2 km E. S. E. of Aït Ourir.
- » » » Some laying 29 km W. of Demnat.
- » » » Hatching over 500 ha 12 km S. S. W. and 14 km N. N. E. of Kasba Tadla.
- » » » Hatching 18 km N. N. E. of Tadla.
- » » » Hatching 13 km S. W. and 5 km N. of Ksiba.
- » » » Hatching 9 km E. of Kenitra.
- » » » Hatching 12 km N. E., 28-40 km E. N. E., 8 km S. E. of Taroudant.
- 22 » » Laying over 850 ha in the neighbourhood of Aït Ourir.
- » » » Laying over 110 ha 14-22 km N. W. of Demnat.
- » » » Hatching 48 km S. S. E. of Tamanar.
- 23 » » A swarm 9 km E. of Kenitra, Copulation occurred.
- » » » A swarm 25 km N. of Fez.
- » » » Hatching in the vicinity of Taroudant.
- » » » Hatching 26 km S. E. of El Kelaa.
- 24 » » Very large yellow swarm 10 km S. S. W. of Aït Ourir.
- » » » A swarm 18 km S. W. of Aït Ourir.
- » » » Marching locusts 46 km S. E. of Tamanar.
- 25 » » A sparse swarm 34 km N. E. of Fez.
- » » » Laying over 1480 ha in the vicinity of Sidi Chiker.
- » » » Hatching 11 km E, 16 km E. N. E., 13 km N. of Taroudant.
- » » » Hatching over 3500 ha 15 km N., 18 km S. W. of Beni Mellal.
- » » » Hatching 10 km S. of Petit Jean.
- » » » Hatching 16 km W. N. W. of Demnat.
- 26 » » Laying over 10 ha 35 km E. N. E. of Mogador.
- » » » Hatching 10 km W. and 13 km N. N. E. of Demnat.
- 27 » » A swarm 10 km W. of Souk el Arba de Tissa (Fez).
- » » » Laying over 50 ha 26 km W. N. W. of Demnat.
- » » » Hatching over 1000 ha at 11 km N. W. of Beni Mellal.
- » » » Hatching over 1000 km 19 km N. of Beni Mellal.
- » » » Hatching over 400 ha 4 km S. E. of Tadla.
- » » » Hatching over 400 ha 21 km N. E. of Tadla.
- » » » Hatching over 800 ha 31 km S. of Safi.
- 28 » » A yellow and brown swarm over 2 sq. km 20 km S. E. of Safi.
- » » » Hatching over 1000 ha 8 km S., over 500 ha 7 km N., and over 1000 ha 10 km N. W. of Tadla.
- » » » Hatching over 200 ha 13 km S., over 500 ha 5 km S. W., over 1000 ha 6 km N. W. at Beni Mellal.
- 29 » » A sparse swarm alighted 28 km S. S. E. of Marrakech.
- » » » A swarm over 5 ha 34 km N. N. E. of Fez.

- 29 April, 1932. Laying over 1200 ha 24-30 km S. E. of Marrakech.  
 30 " " A yellow swarm covering 16 km 26 km S. E. of Mogador.  
 " " " Laying over 120 ha 31-42 km N. of Tamanar.

## TUNISIA.

- 1 April, 1932. A swarm coming from the N. alighted 26 km N. N. E. of Médénine.  
 Copulation occurred.  
 " " " A yellow swarm coming from the W. alighted 40 km W. N. W.  
 of Ben Gardane.  
 2 " " Laying at 27 and 40 km N. W. of Ben Gardane.  
 4 " " Yellow and buff swarm 30-40 km N. N. E. of Médénine alighted  
 on the sea shore. Laying.  
 9-10 " " Hatching 25 km W. S. W. of Médénine.  
 13 " " Hatching 25 km S. W. of Matmata.  
 14 " " Hatching 15 km S. E. of Matmata.  
 17 " " Hatching 20 W. N. W. of Matmata.  
 18-19 " " Hatching 40 km S. W. and 32 S. E. of Matmata.  
 20 " " Hatching 29 km S. of Kebili.  
 " " " Hatching 25-35 km S. E., 35 km S., 8-15 km N, of Matmata.  
 23 " " Hatching at 20-30 km N. E. of Matmata.  
 " " " Hatching in various parts of the Kebili Territory.  
 26-30 " " Measures taken against hoppers in various parts of the Kebili Ter-  
 ritory.

## United States of America : An Unusual Outbreak of Celery Early-Blight (1).

Early blight of celery (*Cercospora apii*) has long been recognized as a serious disease in the United States. As a rule it is usually more destructive in Florida than in the more northern States.

Much attention has accordingly been given to the control of this disease in Florida. And in the important celery-growing region about Sanford, growers are almost invariably equipped with spray apparatus and understand the usual methods of control.

During the winter seasons of 1931 and 1932, however, there occurred an outbreak of *Cercospora apii* so severe as not to be checked by the usual control methods. This outbreak which was reported in detail by P. L. Wellman, stationed at Sanford, is believed by him to be correlated with the unusually high temperatures and relative humidity of the past season.

According to Wellman's report, the meteorological conditions recognized by the growers as favoring early blight are rainless periods accompanied by gentle easterly trade winds, with days bright and warm, and the nights sufficiently cool to produce a heavy dew. Weather of this type occurred most of the time in Sanford during the celery-growing period which closed March 1932.

*Cercospora* spots were noted on the leaves of the celery plants, even in the seed beds, and were very much more abundant as soon as the young plants had become established in the fields. Spraying was begun sooner than usual after transplanting and was continued through the season. Most growers used either liquid

(1) Communication from the official correspondent of the Institute, Dr. N. E. STEVENS, Senior Pathologist in Charge of the Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington, D. C.



Bordeaux spray (4-4-50 formula) or this spray interspersed with copper-lime dust. Occasional growers sprayed as often as once a day during the height of the season. The average period between sprayings was six or seven days. No fields were free from early blight, although, of course, some were better than others.

No estimate of the loss due to the outbreak has been made, although it must have been very great. Many growers plowed up part of the crop because it was apparently not worth harvesting on account of this disease, and in cases where the crop was marketed it was of relative poor quality due to blemished leaves and petioles. Later as lesions developed, they were often attacked by saprophytic fungi such as *Alternaria* and *Botrytis*. While these molds increased the severity of the lesions, they apparently did not attack the unblighted tissues. Added to these different losses from the disease, were the unusual amounts of fertilizer and spray materials used and some injury to the plants by continued use of the spray apparatus in the fields.

### Switzerland: Entomological Features during 1931 (1).

#### VINES.

*Cnephasia wahlbomiana* L. — In May 1931 caterpillars of *C. wahlbomiana* L. caused certain damage in a vineyard in the region of Morges, Vaud. The caterpillars are black, measure 9-10 mm in length, live between the folded leaves of the young shoots and feed on the young stems. Consequently the terminal bud dies.

*Conchylis ambiguella* Hb. and *Polychrosis botrana* Schiff. — The damage caused by the caterpillars of these two Microlepidoptera was in general less than in 1931, both as to the first and second generations.

*Phylloxera vastatrix*. — Galls were observed in the vines of the Federal Experiment Station at Lausanne on Riparia × Gamay Oberlin 604.

#### TREE FRUITS.

*Cydia (Carpocapsa) pomonella* L. — Research carried out in 1931 on the biology of the codlin moth showed the great variability of the life cycle of this Lepidopteron in Romance Switzerland.

On the plateau of Vaud at 400-600 m we have observed only one generation a year.

On the shores of Lake Lemman where the climate is milder a second, but very small, generation appeared in August.

In the Canton of Valais which is warm and dry we have observed in August a second generation, still only partial but larger than that by Lake Lemman. The first flight began on 25 May, 5-6 days earlier than in the Canton of Vaud, showed a marked maximum at the beginning of June and ended towards the middle of June. The second flight took place from 2 to 24 August. On the untreated trees about 10 % of the fruit was attacked by the larvae of the second generation.

*Cheimatobia brumata* L. and *Hybernia defoliaria* L. — The maximum ascent of the females takes place in the first fortnight of November.

The first species seems to have been in slightly greater numbers than in the preceding year.

(1) Communication from the official correspondent of the Institute, Dr. H. FAES, Director of the Station fédérale d'essais viticoles et arboricoles, Lausanne.

*Hoplocampa* sp.? — In certain plum orchards in the cantons of Valais and Vaud larvae of *Hoplocampa* have caused somewhat serious losses, certain trees having the whole crop destroyed.

*Anthonomus cinctus* Redt. — We have observed this species in Valais where it was particularly destructive on William pears.

*Anthonomus rubi* Hbst. — Every year causes damage in a large loganberry plantation at Grandson, Vaud.

This species also attacks strawberries in Valais, but in 1931 the damage was slight.

#### VEGETABLES.

A new parasite of celery was reported in 1931. It is a weevil (*Ceutorhynchus terminatus* Hbst.), the larvae of which bore in the fleshy part of the leaves.

#### Tripolitania: Invasion of Desert Locusts (*Schistocerca gregaria*) (1).

This year (1932) Tripolitania has been invaded by desert locusts even into the coastal zone, in which such a serious invasion can scarcely ever be remembered.

The first swarms coming in great numbers from Southern Tunisia were reported in the regions of Nalut, Giado and Jefren about mid-March. The invasion then gradually extended over nearly all the northern part of the Colony and particularly into the regions of Mizda, the Garian and the Centre of the Gefara (Castel Benito, Azizia, Tagiura, Sidi ben Nur, Gasr Garabulli, Gasr Chiar, Homs).

Laying was abundant almost everywhere. The first hatchings took place at the beginning of April in the region of Nalut, where the control campaign was immediately begun.

Other hatchings occurred later in the region of the Gefara (Castel Benito, Azizia), Mizda, Garian, etc.

The campaign was carried on with great activity in the regions of Nalut, Jefren, Mizda, Garian and in the Gefara by spreading bait poisoned with sodium arsenite or by spraying sodium arsenite.

The results up to the present have been excellent. About 600 quintals of bran and over 50 quintals of arsenite have been used.

In general there has not been serious damage to crops, except in isolated cases in certain concessions where a certain amount of damage has been caused particularly to vines.

It is hoped that the present situation will be satisfactorily met by intensifying the campaign against the hoppers.

#### Yugoslavia: Experiments on the Control of Olive Fly in the Coastal Region (2).

With a view to determining the best insecticide for the control of the olive fly (*Dacus oleae*) comparative experiments were carried out in 1931 on about 100,000 olives in the vicinity of Murter and on about 27,000 olives at Velaluka in the island of Korcula.

(1) Communication from the Government of Tripolitania, transmitted to the International Institute of Agriculture by the Italian Ministry for the Colonies (Bureau of Studies and Propaganda).

(2) Communication from the official correspondent of the Institute, Mr. Petar NOVAK, Station royale agricole d'expérimentation et de contrôle, Split.

In the Murter region were chosen the Modrave district on the mainland and two small islets off Murter, Great Vinik with 2,500 olives and Little Vinik with 1000 olives.

The following insecticides were used in the tests:—

(a) poisoned molasses, using the Berlese formula, i. e., 90 kg of molasses and 2.5 kg of sodium arsenite. This mixture was diluted with 9 parts of water before using.

(b) 'Olivasan', produced by the I. G. Farbenindustrie A.-G., Leverkusen b. Köln a. Rh., in 4 % solution.

(c) 'Glikosan', produced by Messrs Biljana of Belgrade, in 6 % solution.

(d) second molasses mixture (Berlese formula) produced by the Società italiana per l'industria dello zucchero indigeno, Genoa.

Other additional trials were carried out on 6000-15,000 olives.

At Modrave partly 'Olivasan' and partly molasses were used, on Great Vinik 'Glikosan' and on Little Vinik the second molasses mixture. At Velaluka chiefly 'Olivasan' was used and to a lesser extent molasses; 'Glikosan' and the second molasses mixture were used on a small scale. In all the other places 'Olivasan' was used.

In accordance with previously established practice the treatments were applied on only one branch and on the east side of each tree; 250-300 g of insecticide were used for each treatment.

At Modrave only two applications were made, the first between 30 June and 4 July and the second between 2 and 5 August.

On Great and Little Vinik three treatments were applied, on 26 June, 30 July and 31 August.

At Velaluka there were three applications, the first between 18 and 22 June, the second between 23 and 27 July and the third between 27 and 29 August.

At Bibinje there were only two applications owing to insufficiency of insecticide; they were carried out on 5 July and 4 August.

The other experiments not being on an adequate scale are not taken into consideration here.

So as to determine the true efficacy of each insecticide, zinc basins 30 cm in diameter and 10 cm deep were hung on the trees, each holding 1 litre of the mixture; these were refilled with water every 8 days.

Although in the neighbourhood of Murter (Modrave, Great and Little Vinik) scarcely any fly were to be seen, at Velaluka it was always present in greater or lesser numbers.

The basins were inspected on 23 July, 27 August and 22 October.

From the number of flies caught in each basin it may be inferred that the best insecticide was the second molasses mixture and next in order came ordinary molasses. 'Olivasan' and 'Glikosan' proved less efficacious.

During the time of the experiments no rain fell or none capable of washing away the insecticide.

On 11 October the olive orchards in the neighbourhood of Murter were inspected. At Modrave there were no traces of fly infestation either where molasses or where 'Olivasan' was used. It must be mentioned that 1931 was a year of great drought which resulted in a poor crop and small shrivelled fruit.

On the island of Great Vinik where the olives were sprayed with 'Glikosan' there was an average infestation of 25 % with a maximum of 80 %.

On Little Vinik where the second molasses mixture was used there was a mean infection of 0.22 % with a maximum of 3 %.

In the surrounding districts where no sprays were applied there was low infestation (Murter 2 %, Tjesno 4 %, Makirine 3 %, Zlosela 12 %).

At Bibinje there was an average infection of 42 % with a maximum of from 90 to 100 %.

At Velaluka on the olives treated with 'Olivasan' there was an average infection of 50 %, with the second molasses mixture 53 % and with 'Glikosan' 40 %, while in the protection zone (sprayed with 'Olivasan') there was 90 % infection.

The question of the intensity of infestation with the fly seems in general not to be clear: whereas there may often be 80-100 % infection in one locality, in another neighbouring locality it may be extremely low.

It is further complicated by the fact sometimes observed that there is much heavier infection on the sprayed than on the unsprayed trees, although close together.

The infection round Murter is an interesting and puzzling case in point. In the close neighbourhood of the town infection was minimum (Murter 2 %, Tjesno 4 %, zlosela 12 %), while on the island of Great Vinik, where the olives were sprayed with 'Glikosan', infection was much heavier, with an average of 25 % ranging to a maximum of 80 %, and on the other island of Little Vinik only about a hundred metres distant, where the olives were sprayed with the second molasses mixture, there was infection ranging only from 0.22 to 3 %.

It is thus somewhat difficult to establish the efficacy of the various insecticides, particularly as in many cases infection was greater where insecticide sprays had been used than where no control had been attempted even when such places were in close proximity: — Janjina (sprayed) 30 %; Orebic (not sprayed) 20 %; Cavtat (sprayed) 50 %; Dubrovnik (not sprayed) 10 %; Bibinje (sprayed) 42 %; Pasman (not sprayed) 10 %.

If in 1931 the fly control was carried out in the Makarska district or some other locality where infestation was slight it must be concluded that the control has been completely successful, since infestation was low although in surrounding places it was much heavier.

In 1928 olive fly control by means of 'Olivasan' was carried out on the island of Iž near Zara, on which there are two villages, Great Iž and Little Iž. At Great Iž three applications were given, at Little Iž only two. On 19 October the olives were inspected on the island of Iž and on the surrounding islands and an average infection of 1.5 % was found at Great Iž and of 2.5 % at Little Iž. In the other islands there was much heavier infection: at Preko 40 %, at Ugljan 65-87 %, at Rava 90 %. It must thus be concluded that the control on the island of Iž has been completely successful, considering that in all the surrounding places infection was more or less high while on the island it was minimum.

However it may now be asked whether in 1928 there would have been little fly on the island of Iž even without control measures, since a similar phenomenon, though less marked, was observed in 1931 in the same localities, viz, at Iž (30 %), at Preko (20-30 %), at Ugljan (80-100 %) and in none of these was control attempted. The low infection at Murter (2 %) where there was no control is also inexplicable since in the neighbouring island of Great Vinik, where the olives were sprayed, infection was considerable (25 % with a maximum of 80 %).

The question is even more involved since at Little Iž in 1928 only 2 applications of spray were given and the result was almost equal (2.5 %) to that at Great Iž (1.5 %) where there were three sprayings. On the other hand at Bibinje in 1931 after only two sprayings infection was much heavier (43 % with a maximum of 90 %), which seems to indicate that two applications are not sufficient even if made in due time.

If then at Bibinje two applications were insufficient they cannot have been sufficient either at Little Iž in 1928, which would signify that in 1928 the fly infestation of the island was feeble.

Thus it must be concluded that the experiments in olive fly control in 1931 have not given positive results. It will be necessary to continue the experiments over some years on a large scale on the northern and southern coasts, where better supervision of the work will be possible and the various insecticides may be tested under a single administration.

## LEGISLATIVE AND ADMINISTRATIVE MEASURES

**Germany (1).** — A Ordinance of 26 February 1932 forbids in general the use of ethylene oxide for the control of plant and animal parasites; including the species indicated under the name of 'Ungeziefer'.

The authorities may however authorise persons or institutions to make use of ethylene oxide, pure, mixed or in solution, on the following conditions:—

The persons must be fitted for its use; they must in particular be capable of detecting the presence of the gas and must be expert in the use of the products mentioned.

The application of these products must be controlled by a person expressly authorised. Any fumigation must be announced in advance to this person, indicating the place, day and hour of the treatment, also the name of the director responsible for the work.

Any person employed for the application of these products must be provided with a specially adapted and well adjusted gas mask.

Before starting fumigation the buildings must be emptied of human beings and domestic animals and must have a notice drawing attention to the danger of fire and explosion. Every fire must be extinguished and electric current cut off. Rooms or apartments in inhabited buildings may be fumigated only if they are hermetically sealed and if all adjoining rooms are empty of people.

Premises thus disinfected must be aired for at least 20 hours, or 12 hours if they are required industrial purposes. After the premises have if possible been heated to at least 15°C the director of the work shall determine whether any trace of gas remain. The inhabitants might however be allowed to re-enter their premises to put them in order before they can be given permission to return finally.

It is forbidden to sell ethylene oxide, pure, mixed or in solution, to persons other than those authorised to use these products.

Any default will be punishable by fines or imprisonment for a period not exceeding one year.

**England and Wales (2).** — With the object of preventing the introduction of the Cherry Fruit Fly (*Rhagoletis cerasi*), the Importation of Raw Cherries Order of 1932, dated 3rd May, 1932, which comes into operation on 27th May and shall

(1) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

(2) Communication from the Ministry of Agriculture and Fisheries, London, to the International Institute of Agriculture.

remain in force until 30th September, regulates the importation of cherries into England and Wales during the 1932 season.

Cherries grown in France will be admitted without restriction until the 27th May, after which date importation will be prohibited except of cherries grown within a small district around Honfleur.

Cherries grown in Italy will be admitted without restriction until 5th June, after which date only those grown in the Region of Emilia will be allowed to enter ; after the 10th June the importation of cherries grown in any part of Italy will be entirely prohibited.

Cherries grown in Germany will be admitted until 26th June if accompanied by a certificate of origin ; after that date no German cherries will be admitted except those certified not to have been grown south of latitude 53° N. or in East Prussia.

Certificates of origin must accompany cherries grown in any other European country which are imported after the 27th May.

**Belgium.** — By Ministerial Decree of 14 May 1932 importation into Belgium of raw cherries from Germany, France and Italy is allowed only if inspection by the Belgian Special Phytopathological Service, carried out at the importer's expense, shows that the consignments are free from the cherry fruit fly (*Rhagoletis cerasi*).

Importation may take place only by the custom houses of Erquelinnes, Montaleux (Mouscron), Montzen, Antwerp (4th office) and Brussels (1st and 3rd offices).

Consignments found not free from *R. cerasi* at the custom houses of Erquelinnes, Montaleux (Mouscron) and Montzen will be returned.

Consignments found not to be free from *R. cerasi* at the custom houses of Antwerp and Brussels will be burnt at the importer's expense.

Any grower or holder of cherries who finds the presence of *R. cerasi* in his orchards or storehouses is required to notify immediately the burgomaster of the commune who will inform the Minister of Agriculture by telegraph. (*Moniteur Belge*, Bruxelles, 20 mai 1932, 102<sup>e</sup> année, n° 141, p. 2823).

**France.** — By Ministerial Decree of 9 May 1932 the second paragraph of Article 3 of the Ministerial Decree of 15 March 1932 [see this *Bulletin*, 1932, No. 4, p. 58] is modified as follows : — ' Entry into and transit in France of these fruits may take place only by the ports of Dunkerque, Havre, Bordeaux and Marseilles '. (*Journal Officiel de la République Française*, Paris, 10 mai 1932, LXIV<sup>ème</sup> année, n° 109, p. 4922).

**Italy.** — By Ministerial Decree of 23 April 1932 crows, rooks and magpies (*Corvidae*) are to be counted as vermin. Shooting and trapping of these birds in the close season are however regulated by Art. 26 of the single text of the laws and decrees for the protection of wild animals and those governing shooting, approved by Royal Decree No. 117 of 15 January 1931. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 27 aprile 1932, anno 73<sup>o</sup>, n. 97, p. 2005).

\* \* By a Ministerial Decree of 25 April 1932 the wild rabbit is to be counted as vermin. Shooting and trapping of the rabbit in the close season are however regulated by Art. 76 of the ' Testo unico ' of the laws and decrees for the game protection and those governing shooting approved by Royal Decree No. 117 of 15 January 1931. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 30 aprile 1932, anno 73<sup>o</sup>, n. 100, p. 2070).

**Netherlands (The).** — The Dutch Phytopathological Service published in January 1932 Notification No. 301 concerning regulations for importation of potatoes from Germany. As regards declaration with reference to the crops of origin and their immunity from wart disease [*Synchytrium endobioticum*] the German Phytopathological Service uses certificates bearing a seal stamped with the words 'Deutscher Pflanzenschutzdienst'. In future consignments not accompanied by such a certificate will not be admitted for importation into the Netherlands. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin 1932, 12. Jahrg., Nr. 2, S. 16).

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[The first edition of this work, which appeared in 1921, contained 244 pages, 91 figures and 100 coloured plates. The new edition has been considerably expanded in text and illustrations and the first part of the volume has been entirely revised.

to include recent biological, taxonomic or systematic work. Several chapters dealing with insecticides or control methods have been brought up to date or considerably extended. The new text enumerates over 800 troubles caused by some thousands of different insects and is divided into the following parts:—

Place des insectes dans le règne animal. — Organisation des insectes. — Développement et métamorphoses des insectes. — Classification des insectes nuisibles. — Liste des dégâts et des insectes qui les produisent, établie par espèces végétales groupées en ordre alphabétique français. — Planches en couleurs et notices relatives aux insectes reproduits dans les dites planches. — Index alphabétique des noms scientifiques et vulgaires et des synonymes français et étrangers].

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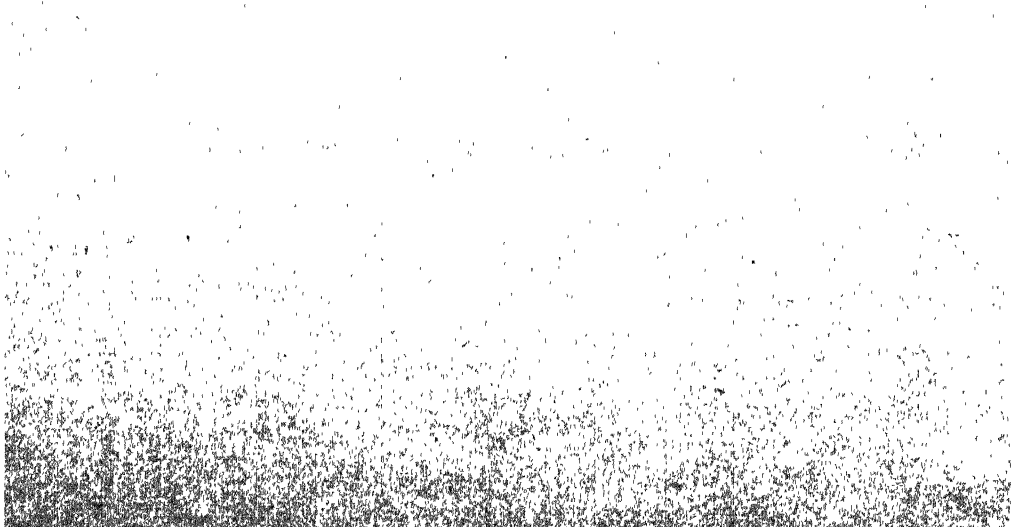
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# AGRICULTURAL ECONOMICS AND SOCIOLOGY





# INDEX OF THE 'MONTHLY BULLETIN OF AGRICULTURAL ECONOMICS AND SOCIOLOGY' FOR THE YEAR 1932

## I.

### TABLE OF CONTENTS

#### A) - BY SUBJECTS

TO THE MEMORY OF ALBERT THOMAS,  
page 214-E.

#### CO-OPERATION

CO-OPERATION IN GENERAL, OR OF VARIOUS KINDS. — *Argentina*: Stages in the Development of Agricultural Co-operation in Argentina, by E. Ferrari, page 135-E. — *Chile*: Co-operative Policy in Chile, 394-E. — *Mexico*: Co-operative Organisation in the United States of Mexico, 107-E. (Errata *corrigé*, 300-E. — *Norway*: Agricultural Co-operation in Norway, by H. Lindstedt, 31-E. and 55-E. — *Spain*: Regulation of Co-operation as an Economic and Social Institution in Spain, 37-E.

CO-OPERATIVE SOCIETIES ENGAGED IN THE SALE, OR IN OPERATIONS PRELIMINARY TO THE SALE, OF AGRICULTURAL PRODUCTS. — *Argentina*: Vine Cultivation and Co-operative Vine-growing Societies in Argentina, page 210-E. — *Bulgaria*: Co-operative sale of Coconuts in Bulgaria, by Y. Kojouharoff, 392-E.

#### INSURANCE AND THRIFT

INSURANCE IN GENERAL OR OF VARIOUS KINDS. — *Bulgaria*: Agricultural Insurance in Bulgaria, page 168-E. — *Canada*: Agricultural Insurance in Canada, 122-E.

INSURANCE AGAINST HAIL. — *Austria*: Hail Insurance in Austria, page 382-E. — *Poland*: Hail Insurance in Poland, 102-E. — *Switzerland*: Hail and Livestock Insurance in Switzerland, 42-E. — *Union of South Africa*: Hail Insurance in South Africa, 366-E.

#### AGRICULTURAL ECONOMY IN GENERAL

LAND PROPERTY AND AGRICULTURAL ECONOMY IN GENERAL. — *International*: Some Economic Problems of tropical Agriculture, page 113-E. — *East Africa*: Land Tenure Problems in East Africa, 65-E.

LEGISLATION AND JURISPRUDENCE. — *Spain*: New Developments in Economic and Social Agricultural Legislation in Spain, page 73-E.

LAND SYSTEMS. — (1) Rural Settlement: *Germany*: Rural Settlement in Post-war Germany, by H. Böker, page 274-E. — (2) Agrarian Reform in general: *Estonia*: The Agrarian Reform in Estonia from 1919 to 1930, 119-E., 155-E. and 249-E.

FARM ACCOUNTANCY, FARM ECONOMICS AND GENERAL CONDITIONS OF AGRICULTURE. — *International*: Provisional Results of Farm Accountancy for 1929-30, page 267-E. — *Germany*: The Position of Agriculture in the Free State of Saxony as deduced from Accountancy Results for the Farm-

ing years 1926-27, 1927-28 and 1928-29, 207-E. — *Java*: Recent Investigations on the Economy of Native Farming in Java, by W. Bally, 87-E.

SCIENTIFIC ORGANISATION OF AGRICULTURAL WORK. — *Finland*: Scientific Organisation of Agricultural Work in Finland, by Prof. K. T. Jutila and P. Erhko, page 219-E.

#### AGRICULTURAL INDUSTRIES AND TRADES.

— *International*: World Production of and World Trade in Table Grapes, by Prof. Dr. K. Ritter and Dr. M. Gutfeld, pages 285-E., 303-E., 339-E. and 373-E.

ECONOMIC FLUCTUATIONS IN AGRICULTURE. — *International*: The Agricultural Crisis in 1930-31, by G. Pavlovsky, page 1-E.

ECONOMIC AND SOCIAL CONDITIONS OF AGRICULTURAL CLASSES. — *International*: (1) Rural Women's Organisations

and the Agricultural Crisis, page 173-E; (2) Broadcasting as an Instrument of Instruction and Propaganda in Rural Life, by E. Marchesi, 187-E; (3) Rural Housing, by G. Costanzo, 316-E. and 350-E.

#### BIBLIOGRAPHY ON ECONOMIC AND SOCIAL QUESTIONS

Bibliography on Economic and Social Questions, pages 20 E., 78 E., 150 E., 329-E., 369-E. and 398-E.

#### LIST OF BOOKS RECEIVED BY THE LIBRARY

Publications received by the Library, pages 28-E., 52-E., 80-E., 115-E., 151-E., 180-E., 217-E., 263-E., 300-E., 335-E., 371-E. and 400-E.

#### B) - BY COUNTRIES.

INTERNATIONAL INSTITUTIONS AND QUESTION. — *Agricultural Economy in general*: (1) The Agricultural Crisis in 1930-31, by G. Pavlovsky, page 1-E; (2) Some Economic Problems of Tropical Agriculture, 413-E; (3) Rural Women's Organisations and the Agricultural Crisis, 173-E; (4) Broadcasting as an Instrument of Instruction and Propaganda in Rural Life, by E. Marchesi, 187-E; (5) Provisional Results of Farm Accountancy for 1929-1930, 267-E; (6) World Production of and World Trade in Table Grapes, by Prof. Dr. K. Ritter and Dr. M. Gutfeld, 285-E, 303-E, 339-E and 373-E; (7) Rural Housing, by G. Costanzo, 316-E and 350-E. — *Bibliography on Economic and Social Questions*: 20-E, 79-E, 177-E, 178-E, 329-E, 331-E, 334-E, 370-E and 399-E.

ARGENTINE. — *Co-operation*: (1) Stages in the Development of Agricultural Co-operation in Argentina, by E. Fer-

rari, page 135-E; (2) Vine Cultivation and Co-operative Vine-growing Societies in Argentina, 210-E;

AUSTRIA. — *Insurance and Thrift*: Hail Insurance in Austria, page 382-E.

BRAZIL. — *Bibliography on Economic and Social Questions*: page 370-E.

BRITISH EMPIRE. — *Bibliography on Economic and Social Questions*: pages 50-E, 150-E and 330-E.

BULGARIA. — *Co-operation*: Co-operative Sale of Cocoons in Bulgaria, by Y. Kojoukharoff, page 392-E. — *Insurance and Thrift*: Agricultural Insurance in Bulgaria, 168-E.

CANADA. — *Insurance and Thrift*: Agricultural Insurance in Canada, page 198-E.

CHILE. — *Co-operation*: Co-operative Policy in Chile, page 394-E.

CZECHOSLOVAKIA. — *Bibliography on Economic and Social Questions*: pages 27-E and 180-E.

EAST AFRICA. — *Land Tenure Problems in East Africa*, page 65-E.



- ESTONIA. — *Agricultural Economy in general: The Agrarian Reform in Estonia from 1919 to 1930*, pages 119-E, 155-E and 249-E.
- FINLAND. — *Agricultural Economy in general: Scientific Organisation of Agricultural Work in Finland*, by Prof. K. T. Jutila and P. Erkkö, page 219-E.
- GERMANY. — *Agricultural Economy in general: (1) The Position of Agriculture in the Free State of Saxony as deduced from Accountancy Results for the Farming Years 1926-27, 1927-28 and 1928-29*, page 207-E; (2) *Rural Settlement in Post-war Germany*, by H. Böker, 274-E. — *Bibliography on Economic and Social Questions: 22-E, 23-E, 49-E and 78-E.*
- GREAT BRITAIN AND NORTHERN IRELAND. — *Bibliography on Economic and Social Questions: page 21-E.*
- IRISH FREE STATE. — *Bibliography on Economic and Social Questions: page 330-E.*
- ITALY. — *Bibliography on Economic and Social Questions: pages 24-E, 79-E, 150-E, 179-E, 180-E, 335-E and 398-E.*
- JAVA. — *Agricultural Economy in general: Recent Investigations on the Economy of Native Farming in Java*, by W. Bally, page 87-E.
- MEXICO. — *Co-operation: Co-operative Organisation in the United States of Mexico*, page 107-E. (*Errata corrige* 300-E).
- NORWAY. — *Co-operation: Agricultural Co-operation in Norway*, by H. Lindstedt, pages 37-E and 55-E.
- POLAND. — *Insurance and Thrift: Hail Insurance in Poland*, page 102-E.
- SPAIN. — *Agricultural Economy in general: (1) Regulation of Co-operation as an Economic and Social Institution in Spain*, page 37-E; (2) *New Developments in Economic and Social Agricultural Legislation in Spain*, 73-E.
- SWITZERLAND. — *Insurance and Thrift: Hail and Livestock Insurance in Switzerland*, page 42-E.
- UNION OF SOUTH AFRICA. — *Insurance and Thrift: Hail Insurance in South Africa*, page 366-E. — *Bibliography on Economic and Social Questions: 24-E and 178-E.*
- UNITED STATES. — *Bibliography on Economic and Social Questions: pages 22-E, 27-E, 51-E, 177-E and 332-E.*
- U. R. S. S. — *Bibliography on Economic and Social Questions: pages 25-E and 369-E.*

## II.

### ALPHABETICAL LIST OF AUTHORS OF ORIGINAL ARTICLES

- |   |   |
|---|---|
| BALLY W., page 87-E.                        | KOJOUKHAROFF V., 392-E.                   |
| BÖKER H., 274-E.                            | JUTILA K., T., 219-E.                     |
| COSTANZO G., 316-E, 350-E.                  | LINDSTEDT H., 31-E, 55-E.                 |
| ERKKÖ P., 219-E.                            | MARCHESI E., 187-E.                       |
| FERRARI E., 135 E.                          | PAVLOVSKY G., 1-E.                        |
| GUTTFELD M., 285-E, 303-E, 349-E and 373-E. | RITTER K., 285-E, 303-E, 339-E and 373-E. |

III.

ALPHABETICAL LIST OF AUTHORS OF WORKS CONSULTED  
IN THE PREPARATION OF ARTICLES

ALERS R., *page* 102-E.  
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BÓREA D., 149-E.  
Brandenburg S. J., 351-E.  
Bruckmann J. H., 101-E.  
Bunge G., 214-E.

CAMANNI V., 355-E.  
Collan O., 226-E.  
Cruz M. E., 398-E.

DE OLAZABAL A., 149-E.

FALKE, 207-E.  
Fannes J., 226-E.  
Fontana A., 355-E.

GARAVINI G., 355-E.  
Giróla C. D., 149-E.  
Goch F. van, 101-E.  
Gosselin, 198-E.  
Gosseries F., 320-E.  
Guardiola B. S., 398-E.

ISENSEN H., 207-E.

JUTILA K. T., 220-E.

KOORENHOF A. C. DJOEMITO PADMO-  
DIHARDJO, 101-E.

LAHITTE E., 149-E.  
Lang E., 285-E.  
Leimdörfer, 387-E.  
Lugard, Lord, 71-E.

MARTIN J. G., 324-E.  
Mork R., 65-E.  
Myllarniemi H., 244-E.

OCHSE J. J., 101-E.  
Otte F., 101-E.  
Overaae H., 64-E.

PAERELS B. A., 88-E, 101-E.  
Pihkala R., 222-E.  
Pettersson R., 364-E.  
Ponfik-Wenzel, 285-E.  
Popov D. G., 326-E.  
Puntoni V., 318-E.

RADEN IR. GOENSENG IAKANDAR, 101-E.  
Reif, 389-E.

SCHIELTEMA A. M. P. A., 101-E.  
Scholtz C., 354-E.  
Sténhoff G., 364-E.  
Smits M. B., 101-E.  
Soeparjo Witmoatmodjojo R. M., 102-E.  
Solis R., 397-E.  
Sunila J. E., 222-E.

TCHARDAFONOFF M., 326-E.

VEER K. VAN DER, 91-E, 101-E.  
Vink G. J., 101-E.  
Virtanan K. L., 222-E.  
Vries E. DE, 101-E.  
Vroon L. J., 101-E.

WIJERS E. W., 101-E.  
Wit J., 101-E.

ZÖRNER H., 285-E.

# AGRICULTURAL STATISTICS



# INDEX TO THE MONTHLY CROP REPORT AND AGRICULTURAL STATISTICS FOR THE YEAR 1932

## GENERAL REVIEW

JANUARY: Cereals, *page* 1-S. — Rice, 17-S. — Sugar, 22-S. — Vines, 29-S. — Cotton, 34-S. — Flax, 38-S.

FEBRUARY: Cereals, 85-S. — Potatoes, 99-S. — Sugar, 101-S. — Flax, 110-S. — Hops, 114-S.

MARCH: Cereals, 165-S. — Sugar, 180-S. — Vines, 183-S. Olives, 185-S. — Livestock and derivatives, 198-S.

APRIL: Cereals, 229-S. — Maize, 240-S. — Sugar, 246-S. — Livestock and derivatives, 261-S.

MAY: Cereals, 303-S. — Rice, 317-S. — Sugar, 326-S. — Vines, 328-S. — Livestock and derivatives, 344-S.

JUNE: Cereals, 367-S. — Sugar, 387-S.

JULY: Cereals, 431-S. — Maize, 446-S. — Sugar, 452-S. — Vines, 459-S. — Cotton, 463-S. — Sericulture, 472-S. — Fodder crops, 473-S.

AUGUST: Cereals, 507-S. — Maize, 521-S. — Potatoes, 524-S. — Sugar, 528-S. — Vines, 533-S. — Olives, 537-S. — Cotton, 538-S. — Flax, 541-S. — Fodder crops, 547-S.

SEPTEMBER: Cereals, 579-S. — Maize, 592-S. — Potatoes, 598-S. — Sugar, 601-S. — Vines, 606-S. — Cotton, 610-S. — Flax, 613-S. — Fodder crops, 619-S.

OCTOBER: Cereals, 651-S. — Maize, 675-S. — Potatoes, 680-S. — Sugar, 683-S. — Vines, 688-S. — Cotton, 692-S. — Flax, 696-S. — Fodder crops, 702-S.

NOVEMBER: Cereals, *page* 735-S. — Sugar, 752-S. — Vines, 757-S. — Olives, 762-S. — Cotton, 764-S. — Sericulture, 774-S. — Fodder crops, 776-S.

DECEMBER: World cereal production, 811-S. — The world rice situation, 824-S. — Sugar, 833-S. — Vines, 840-S. — Cotton, 845-S. — Flax, 848-S.

## I. — PRODUCTION.

*Information concerning various countries.*

### 1. CEREALS.

(Wheat, rye, barley, oats).

January: *page* 6-S.

February: 87-S.

March: 172-S, 192-S, 194-S.

April: 231-S, 256-S, 257-S.

May: 307-S, 338-S, 339-S, 366-S.

June: 369-S, 404-S, 405-S.

July: 434-S.

August: 512-S.

September: 583-S, 630-S.

October: 667-S.

November: 740-S, 789-S.

December: 816-S, 863-S.

### 2. MAIZE.

January: *page* 823-S.

February: 96-S.

March: 177-S, 194-S.

April: 242-S, 257-S.

May: 315-S, 338-S, 366-S.

June: 382-S, 404-S, 405-S.

July: 447-S.

August: 521-S.

September: 594-S.

October: 677-S.

November: 748-S, 789-S.

December: 823-S.

### 3. RICE.

January: *page* 20-S.  
February: 98-S.  
March: 179-S, 194-S.  
April: 244-S, 256-S, 257-S.  
May: 325-S, 338-S, 339-S.  
June: 384-S, 404-S, 405-S.  
July: 448-S.  
August: 523-S.  
September: 596-S, 630-S.  
October: 679-S.  
November: 749-S.  
December: 830-S.

### 4. POTATOES.

January: *page* 21-S.  
February: 101-S.  
March: 180-S, 193-S, 194-S.  
April: 245-S, 257-S.  
May: 325-S, 338-S, 339-S.  
June: 385-S, 404-S, 405-S.  
July: 450-S.  
August: 526-S.  
September: 599-S.  
October: 681-S.  
November: 751-S.  
December: 832-S.

### 5. SUGAR.

January: *page* 27-S.  
February: 104-S.  
March: 182-S, 193-S, 194-S.  
April: 247-S, 256-S, 257-S.  
May: 327-S, 338-S.  
June: 387-S, 404-S, 405-S.  
July: 456-S.  
August: 530-S.  
September: 604-S, 630-S.  
October: 687-S.  
November: 755-S.  
December: 838-S.

### 6. VINES.

January: *page* 30-S.  
February: 105-S.  
March: 184-S, 193-S, 194-S.  
April: 249-S, 256-S, 257-S.  
May: 329-S, 338-S.

June: *page* 391-S, 404-S.  
July: 460-S.  
August: 534-S.  
September: 607-S.  
October: 690-S.  
November: 759-S.  
December: 841-S.

### 7. OLIVES.

January: *page* 33-S.  
February: 107-S.  
March: 187-S, 194-S.  
April: 251-S, 256-S, 257-S.  
May: 331-S, 338-S.  
June: 394-S, 404-S.  
July: 463-S.  
August: 538-S.  
September: 610-S.  
October: 692-S.  
November: 764-S.  
December: 844-S.

### 8. COTTON.

January: *page* 36-S.  
February: 108-S.  
March: 188-S, 193-S, 194-S.  
April: 251-S, 257-S.  
May: 331-S, 338-S, 339-S.  
June: 395-S, 404-S, 405-S.  
July: 464-S.  
August: 539-S.  
September: 612-S.  
October: 694-S.  
November: 765-S.  
December: 846-S.

### 9. FLAX.

January: *page* 40-S.  
February: 112-S.  
March: 190-S, 193-S, 194-S.  
April: 252-S, 256-S, 257-S.  
May: 333-S, 338-S, 366-S.  
June: 398-S, 404-S.  
July: 466-S.  
August: 542-S.  
September: 614-S, 630-S.  
October: 698-S.  
November: 767-S.  
December: 851-S.

10. HEMP.

January: *page* 42-S.  
February: 113-S.  
March: 193-S, 194-S.  
April: 253-S, 256-S, 257-S.  
May: 333-S, 338-S, 366-S.  
June: 399-S, 404-S, 405-S.  
July: 467-S.  
August: 543-S.  
September: 615-S.  
October: 698-S.  
November: 768-S.  
December: 852-S

11. HOPS.

January: *page* 44-S.  
February: 117-S.  
March: 191-S, 193-S, 194-S.  
April: 257-S.  
May: 334-S, 338-S.  
June: 399-S, 404-S.  
July: 468-S.  
August: 543-S.  
September: 615-S.  
October: 699-S.  
November: 769-S.  
December: 851-S.

12. TOBACCO.

January: *page* 43-S.  
February: 114-S.  
March: 191-S, 193-S, 194-S.  
April: 253-S, 257-S.  
May: 334-S, 338-S.  
June: 400-S, 404-S.  
July: 468-S.  
August: 543-S.  
September: 616-S, 630-S.  
October: 699-S.  
November: 770-S.  
December: 852-S.

13. CACAO.

January: *page* 44-S.  
February: 117-S.  
March: 191-S.  
April: 254-S.  
May: 335-S.

June: *page* 401-S.  
July: 469-S.  
August: 545-S.  
September: 617-S, 630-S.  
October: 700-S.  
November: 771-S.  
December: 853-S.

14. TEA.

February: *page* 118-S.  
March: 191-S.  
April: 254-S.  
May: 334-S.  
June: 401-S.  
July: 469-S.  
August: 544-S.  
September: 617-S, 630-S.  
October: 700-S.  
November: 771-S.  
December: 855-S.

15. COFFEE.

January: *page* 45-S.  
February: 118-S.  
March: 195-S.  
April: 254-S.  
May: 335-S.  
June: 401-S.  
July: 470-S.  
August: 544-S.  
September: 617-S.  
October: 700-S.  
November: 771-S.  
December: 855-S.

16. GROUNDNUTS.

January: *page* 45-S.  
February: 118-S.  
March: 195-S.  
April: 255-S.  
May: 336-S, 338-S.  
June: 402-S.  
July: 470-S.  
August: 545-S.  
September: 618-S.  
October: 701-S.  
November: 773-S.  
December: 856-S.

17. COLZA, SESAME AND MUSTARD.

January: *page* 45-S.  
February: 118-S.  
March: 195-S.  
April: 255-S, 256-S.  
May: 337-S, 366-S.  
June: 402-S, 404-S.  
July: 471-S.  
August: 546-S.  
September: 618-S.  
October: 701-S.  
November: 774-S, 789-S.  
December: 856-S.

18. JUTE.

January: *page* 46-S.  
February: 119-S.  
March: 196-S.  
April: 255-S.  
May: 337-S.  
August: 546-S.  
October: 701-S.

19. SERICULTURE.

January: *page* 42-S.  
February: 114-S.  
March: 194-S.  
April: 256-S, 257-S.  
May: 337-S, 338-S.  
June: 403-S.  
August: 546-S.  
September: 619-S.  
October: 702-S.  
November: 775-S.  
December: 857-S.

20. FODDER CROPS.

January: *page* 46-S.  
February: 119-S.  
March: 196-S.  
April: 258-S.  
May: 339-S.  
June: 406-S.  
July: 473-S.  
August: 547-S.  
September: 619-S.  
October: 702-S.  
November: 776-S.  
December: 857-S.

II. — LIVESTOCK  
AND DERIVATIVES.

I. LIVESTOCK POSITION  
IN VARIOUS COUNTRIES.

Germany . . . . . January: *page* 51-S,  
54-S; April,  
270-S; July,  
479-S; October,  
706-S.  
Austria . . . . . January, 52-S.  
Belgium . . . . . April, 271-S.  
Canada . . . . . April, 274-S; May,  
343-S.  
Chile . . . . . September, 628-S.  
Denmark . . . . . February, 125-S.  
Estonia . . . . . November, 780-S.  
Irish Free State . . August, 552-S.  
United States . . . February, 129-S;  
August, 554-S.  
France . . . . . February, 126-S  
September, 625-S  
Great Britain and  
N. Ireland . . . . September, 626-S.  
England & Wales . . October, 707-S.  
Northern Ireland . . August, 553-S.  
Hungary . . . . . November, 781-S.  
Kenya . . . . . November, 784-S.  
Lithuania . . . . . April, 272-S.  
Luxemburg . . . . . February, 129-S.  
Norway . . . . . October, 707-S.  
New Zealand . . . . February, 132-S;  
March, 206-S;  
April, 276-S;  
August, 555-S;  
December, 861-S.  
Netherlands . . . . January, 54-S.  
Poland . . . . . November, 782-S.  
Sweden . . . . . December, 859-S.  
Czechoslovakia . . . April, 273-S.  
U. S. S. R. . . . . April, 273-S.  
Uruguay . . . . . April, 275-S; Sep-  
tember, 629-S.  
Yugoslavia . . . . . June, 409-S.

2. CURRENT INFORMATION  
ON LIVESTOCK AND DERIVATIVES.

January, *page* 49-5.  
February, 123-5.  
March, 204-S.



April, *page* 268-S.  
May, 342-S, 366-S.  
July, 480-S.  
August, 555-S.  
September, 624-S, 629-S.  
October, 708-S.  
November, 785-S, 786-S.  
December, 860-S, 861-S.

April: *page* 290-S.  
May: 358-S.  
June: 422-S.  
July: 494-S.  
August: 570-S.  
September: 643-S.  
October: 722-S.  
November: 802-S.  
December: 875-S.

### III. — TRADE AND STOCKS.

#### 1. MONTHLY IMPORTS AND EXPORTS.

(Wheat, wheat flour, total wheat and flour, rye, barley, oats, maize, rice, cotton, linseed, tea, coffee, cacao, butter, cheese, wool).

January: *page* 55-S.  
February: 134-S.  
March: 207-S.  
April: 277-S.  
May: 346-S.  
June: 411-S.  
July: 482-S.  
August: 559-S.  
September: 631-S.  
October: 710-S.  
November: 790-S.  
December: 864-S.

#### 2. STOCKS.

January: *page* 63-S.  
February: 142-S.  
March: 215-S.  
April: 285-S.  
May: 354-S.  
June: 419-S.  
July: 490-S.  
August: 566-S.  
September: 639-S.  
October: 718-S.  
November: 798-S.  
December: 872-S.

### IV. PRICES AND RATES OF OCEAN FREIGHTS.

#### 1. MONTHLY REVIEW OF PRICES.

January: *page* 70-S.  
February: 151-S.  
March: 219-S.

#### 2. QUARTERLY REVIEW OF PRICES.

January: *page* 73-S.  
April: 293-S.  
July: 497-S.  
October: 725-S.

#### 3. PRICES OF AGRICULTURAL PRODUCTS.

January: *page* 77-S.  
February: 145-S, 154-S.  
March: 223-S.  
April: 297-S.  
May: 361-S.  
June: 425-S.  
July: 501-S.  
August: 573-S.  
September: 646-S.  
October: 729-S.  
November: 805-S.  
December: 878-S.

#### 4. INDEX-NUMBERS OF PRICES.

January: *page* 79-S, 80-S.  
February: 155-S.  
March: 224-S.  
April: 298-S.  
May: 362-S.  
June: 426-S.  
July: 503-S.  
August: 574-S.  
September: 647-S.  
October: 730-S.  
November: 806-S.  
December: 879-S.

#### 5. RATES OF FREIGHT.

January: *page* 83-S.  
February: 158-S.  
March: 227-S.

April: *page* 301-S.  
May: 365-S.  
June: 429-S.  
July: 506-S.  
August: 577-S.  
September: 650-S.  
October: 733-S.  
November: 809-S.  
December: 882-S.

6. IMPORT DUTIES.

January: *page* 66-S, 79-S.  
February: 159-S.  
March: 222-S.  
April: 289-S.  
May: 357-S.  
June: 410-S.  
July: 493-S.  
August: 557-S.  
September: 642-S.  
October: 721-S.  
November: 801-S.  
December: 863-S.

7. EXCHANGE RATES.

January: *page* 83-S.  
February: 158-S.  
March: 227-S.  
April: 301-S.  
May: 365-S.  
June: 429-S.  
July: 506-S.  
August: 577-S.  
September: 650-S.  
October: 733-S.  
November: 809-S.  
December: 882-S.

8. RECIPROCAL PARITIES OF THE  
VARIOUS CURRENCIES.

January: *page* 84-S.  
February: 164-S.  
March: 228-S.  
April: 302-S.  
June: 430-S.  
August: 578-S.  
October: 734-S.  
November: 810-S.

# AGRICULTURAL SCIENCE AND PRACTICE

1

# INDEX TO THE 'MONTHLY BULLETIN OF AGRICULTURAL SCIENCE AND PRACTICE, FOR THE YEAR 1932

## I.

### SUBJECT INDEX.

#### A

AGRICULTURAL ENGINEERING, see farm buildings, reclamation, and agricultural machinery.  
 Agricultural machinery, see machinery.  
 Airplanes, forest protection by, 36-T.  
 Albinism, 45-T.  
 Algeria: Agricultural machinery, 92-T; Date palm, 82-T; Stock-breeding, 905-T.  
 Animal husbandry, 7-T, 15-T, 50-T, 54-T, 56-T, 97-T, 144-T, 178-T, 273-T, 305-T, 345-T, 365-T.  
 Apples, 82-T.  
 Argentina: Catalogues of agricultural publications, 364-T; Groundnuts, 478-T; Slaughter, 306-T; Subtropical agriculture, 245-T.  
 Asparagus, 387-T.  
*Aspergillus*, 240-T.  
 Australia: Wheat, 387-T.  
 Austria: Stock farming, 390-T.  
*Azotobacter*, 240-T, 383-T.

#### B

BANANAS, 147-T, 485-T.  
 Beer, 486-T.  
 Bees, 365-T.  
 Belgian Congo: Cotton, 171-T.  
 Belgium: Pigs, 309-T.  
 Botany, 273-T, 364-T, 274-T.  
 Bulgaria: Eggs, 436-T; Sericulture, 181-T; Stock breeding, 309-T.  
 Butter, 314-T, 406-T.

#### C

CACAO, 340-T.  
 Cactus, spineless, 54-T.  
 Canada: Animal husbandry, 305-T.  
 Carburants (vegetable), 445-T.  
 Carob-tree, 91-T.  
 Carts, farm, 480-T.  
 Castor oil, 189-T.  
 «Catsup», 444-T.  
 Cattle, 7-T, 15-T, 53-T, 54-T, 56-T, 97-T, 144-T, 180-T, 250-T, 298-T, 305-T, 308-T, 349-T, 454-T.  
 Charcoal, 371-T.  
 Cereals, 45-T, 161-T.  
 Cheese, 181-T, 407-T.  
 Chemical fertilisers, influence on cancer, 243-T.  
 Chemistry, agricultural, 65-T.  
 Chlorophyll, 243-T.  
 Cinema in agriculture, 304-T.  
*Cistus ladaniferus*, 148-T.  
 Citrus, 24-T.  
 Climatology, 270-T.  
 Coconut, 248-T, 294-T, 341-T.  
 Coffee, 90-T, 173-T.  
 Columbia: Cultivated plants, 338-T.  
 Competitions, 444-T.  
 Concentration of plant and animal liquids 18-T.  
 Congresses, 35-T, 45-T, 64-T, 145-T, 153-T, 178-T, 200-T, 359-T, 374-T, 500-T.  
 Cotton, 22-T, 90-T, 171-T, 295-T, 339-T, 362-T, 423-T, 475-T, 487-T.  
 Cover crops, 173-T, 250-T.  
 Crisis in agriculture, 379-T.  
 Cyperus, edible, 259-T.  
*Cyrtosperma Merkusii*, 341-T.  
 Czechoslovakia: Fertilising, 43-T; Forest policy, 153-T; Stock farming, 390-T.

D

DAIRY, 22-T, 56-T, 178-T, 313-T, 349-T,  
362-T, 406-T, 436-T, 484-T, 492-T.  
Dairy testing, 57-T.  
Date palm, 82-T.  
Denmark: Use of wood as a fuel, 369-T.  
*Desmodium ovalifolium*, 250-T.  
Draught cow, 349-T.  
Dry ice, 18-T, 147-T, 360-T.

E

ECOLOGY, 7-T, 386-T, 421-T.  
Education, agricultural, 448-T, 488-T.  
Eggs, 436-T, 447-T.  
Egypt: Olive growing, 475-T.  
Ensilage, 1-T, 55-T.  
Erosion, 25-T.  
Eritrea: Coffee, 90-T.  
Eucalyptus, 458-T.  
Exhibitions, 26-T, 224-T, 231-T, 388-T,  
426-T.

F

FARM BUILDINGS, 407-T.  
Fattening, cattle, 7-T, 56-T, 483-T.  
Feeding, cattle, 7-T, 54-T, 55-T, 143-T,  
180-T, 349-T, 362-T, 483-T.  
Fertilisers, 5-T, 43-T, 79-T, 124-T, 240-T,  
384-T, 473-T.  
Fibrous plants, 313-T, 362-T, 486-T.  
Finland: Timber industry, 227-T.  
Fish, 149-T, 447-T.  
Flax, 22-T.  
Flour, 485-T.  
Fodders, 55-T.  
Forestry: Afforestation of dunes, 367-T;  
Birch, 366-T; Crisis affecting forest  
products, 67-T, 108-T; Erosion, 25-T;  
Eucalyptus, 458-T; Forestry in Poland  
156-T; Forestry in the United States,  
229-T; Forest policy, 153-T, 455-T;  
Forestry Research Stations, 230-T;  
Grazing, 408-T; Influence of forests  
on precipitation, 151-T; International  
Association of Wood Anatomists,  
230-T; Protection against damage  
by wind, 275-T, 316-T; Regeneration

of forests, 190-T; Tapping, 373-T;  
Timber industry, 227-T; Tropical  
woods, 153-T.  
France: Agricultural education, 488-T;  
Exhibitions, 388-T; Herdbooks, 179-T;  
Meat, 481-T; Tapping, 460-T; Sheep  
breeding, 308-T, 350-T; Wheat, 421-T.  
French West Africa: Agricultural machi-  
nery, 93-T; Rainfall, 122-T.  
Frost protection, 121-T.  
Fruit production, 24-T, 81-T, 91-T,  
340-T.  
Fuels, 754-T, 231-T, 343-T, 361-T, 369-T,  
406-T, 445-T.  
Fur farming, 17-T, 57-T, 310-T, 407-T.

G

GEESE, 142-T.  
Genetics, 54-T, 96-T, 199-T, 287-T,  
330-T.  
Germany: Cattle breeding, 97-T, 142-T,  
308-T; Cinematographic Service of  
the Ministry of Agriculture, 304-T;  
Connection between health of stock  
and subterranean water, 306-T; Gras-  
ses, 126-T; Horses, 143-T, 365-T;  
Mechanisation, 388-T; Pigs, 180-T,  
484-T; Soils of Bavaria, 271.  
Grasses, 126-T, 226-T.  
Great Britain: Afforestation of dunes,  
367-T; Forestry work, 455-T; Fox  
farming, 58-T; Softwoods, 372-T;  
Stock breeding, 95-T.  
Greece: Stock breeding, 98-T.  
Green manure, 79-T, 173-T.  
Groundnuts, 478-T.  
Guadaloupe: Agricultural machinery,  
94-T.  
Guano, 43-T.  
Guatemala: Cultivated plants, 338-T.

H

HARVESTER-THRASHERS, 95-T.  
Hawaii: Forestry, 36-T.  
Hemp, 127-T.  
Herd books, 14-T, 179-T, 345-T.  
Hevea, 163-T, 171-T, 207-T, 294-T,  
477-T, 486-T.

Honey, 365-T.  
Horses, 143-T, 151-T, 179-T, 307-T,  
265-T, 483-T.  
Horticulture, 106-T.  
Hungary: Cattle breeding, 298-T; Soil  
requirements in minerals, 239-T; Stock  
farming, 390-T.

I

ICE CREAM, 58-T, 98-T.  
Immunisation of plants, 287-T.  
India, British: Agricultural production,  
338-T; Cotton, 423-T, 475-T; Live-  
stock breeding, 14-T; Meteorology,  
479-T.  
Indochina: 452-T; Sugar cane, 90-T.  
Industries of animal products, 22-T,  
25-T, 362-T, 447-T, 487-T.  
Industries of plant products, 18-T, 359-T,  
485-T.  
Institutions of agricultural science and  
practice, 327-T.  
Iodine, 125-T.  
Iodised salt, 56-T.  
Irrigation, 107-T.  
Italy: Agricultural machinery, 224-T;  
Agricultural research, 490-T; Exhi-  
bitions, 23-T, 224-T, 231-T, 426-T;  
Fertiliser, 473-T; Flora, 227-T; Land  
reclamation, 426-T, 479-T; Leucite,  
79-T; Horse breeding, 179-T; Micro-  
biology of soils, 78-T; Stock farming,  
53-T, 97-T, 178-T, 348-T.  
Ivory Coast: Cotton, 190-T.

J

JAPAN: Rice, 89-T.  
Java: Tea, 425-T.

K

KENYA: Animal husbandry, 54-T.

L

LAND RECLAMATION, 426-T, 479-T.  
Land settlement, 149-T.  
Latex, 163-T, 171-T, 172-T, 207-T,  
294-T, 313-T.

Leguminous crops, 296-T.  
Leucite, 79-T.  
Liming, 7-T.  
Livestock breeding, 13-T, 14-T, 24-T,  
95-T, 142-T, 227-T, 250-T, 298-T,  
305-T, 308-T, 348-T, 434-T, 454-T.  
Lucerne, 80-T.  
*Lycium vulgare*, 162-T.

M

MACHINERY, AGRICULTURAL, 66-T, 92-T,  
107-T, 139-T, 224-T, 342-T, 390-T,  
408-T, 481-T, 492-T.  
Madagascar: Agricultural machinery,  
94-T; Textile plants, 486-T.  
Maize, 297-T, 339-T.  
Manchuria: Stock breeding, 309-T.  
Manganese, 44-T.  
Manioc, 189-T.  
Marocco: Agricultural machinery, 93-T;  
Olive growing, 388-T.  
Mauritius: Rice, 89-T.  
Meat, 148-T, 481-T.  
Mechanisation, 388-T.  
Melon, 245-T.  
Meteorology, 3-T, 23-T, 41-T, 77-T,  
121-T, 381-T, 479-T.  
Mexico: Cultivated plants, 339-T.  
Microbiology, 78-T, 125-T.  
Milk, 22-T, 56-T, 178-T, 313-T, 349-T,  
362-T, 406-T, 436-T.  
Milking, 56-T, 484-T.  
Mowers, 139-T.  
Mutations, 330-T.

N

NEW ZEALAND: Dairy testing, 57-T.  
Nitrogen, 124-T, 241-T, 387-T, 473-T.  
Norway: Charcoal, 371-T.

O

OAK, 461-T.  
Oils, seed, 22-T, 129-T, 147-T.  
Oil yielding plants, 340-T.  
Olive growing, 444-T, 467-T, 475-T.

Olive: oil production, 310-T, 351-T,  
360-T, 388-T, 422-T.  
Oranges, 91-T.  
Ostriches, 98-T.

P

PALEM OIL, 406-T.  
Peppers, 340-T.  
Philippines: Pineapples, 248-T; Rice,  
171-T; Rubber, 172-T.  
Pepper, 296-T.  
Phosphates, 44-T, 124-T, 242-T.  
Physiology-animals, 14-T, 349-T.  
Pigs, 16-T, 98-T, 143-T, 180-T, 310-T,  
484-T.  
Pineapples, 248-T.  
*Pinus Pineae*, 457-T.  
*Pirocydonia Claraci* L. D., 128-T.  
Plant growth, 6-T, 45-T.  
Plant nutrient deficiencies, 5-T.  
Poland: Forestry in Poland, 156-T;  
Pigs, 180-T.  
Portugal: Olive oil, 442-T.  
Potash salts, 385-T, 474-T.  
Potatoes, 55-T, 126-T, 339-T.  
Poultry, 17-T, 181-T.  
Preservation of agricultural products,  
18-T, 147-T, 149-T.  
Protection of the plant breeder's rights,  
199-T.

R

RABBIT-BREEDING, 455-T.  
Radium, 3-T.  
Rain, artificial production of, 41-T.  
Rainfall, 122-T.  
Refrigeration, 148-T, 158-T, 310-T, 403-T,  
485-T.  
Research, agricultural, 449-T, 489-T.  
Retting, 362-T.  
Rhodesia: Pastoral industry, 54-T.  
Rice, 89-T, 171-T, 291-T, 341-T, 486-T.  
Rubber, 163-T, 171-T, 207-T, 294-T,  
477-T, 487-T.  
Rumania: Stock farming, 390-T.  
Rubber, 163-T, 171-T, 172-T, 207-T,  
294-T, 313-T.

S

SEEDS, 23-T, 226-T.  
Sericulture, 181-T.  
Sesamum, 129-T, 296-T.  
Sheep, 16-T, 24-T, 57-T, 97-T, 144-T,  
308-T, 350-T, 484-T.  
Siam: Agricultural production, 291-T;  
Silica, 7-T.  
Silicates, 6-T.  
Silo, 344-T.  
Slaughter, 306-T.  
Soil science: Absorbent power of soils,  
272-T; Effect of drying, 41-T; Effects  
of ultra-violet light on soils, 41-T;  
Catalytic power of soils, 239-T; Col-  
loidal clays, 78-T; Humification of  
soil, 42-T, 384-T; Mechanical analysis  
of soil, 4-T, 78-T, 272-T; Microbiology  
of soils, 78-T; pH of soil, 122-T;  
Soil requirements in minerals, 239-T;  
Soil sterilisation, 4-T; Soils of Ba-  
varia, 271-T.  
Spain: Animal husbandry, 53-T; Olive  
oil, 423-T; Tobacco, 419-T.  
Succulent plants, 227-T.  
Sugar, 403-T.  
Sugar beet, 127-T, 161-T, 359-T.  
Sugar cane, 90-T, 295-T.  
Sweden: Agricultural research, 489-T;  
Fuel, 370-T.  
Sweet potatoes, 91-T.  
Switzerland: Agricultural education,  
448-T; Fuels vegetable, 154-T; Horse  
breeding, 179-T; Utilisation of tim-  
ber, 460-T;  
Synthetic ammonia, 240-T.  
Syria: Cotton, 90-T.

T

TAPPING, 460-T.  
Tea, 425-T.  
Testing draft animals, 173-T.  
Textiles, 313-T, 362-T, 486-T.  
Tillering, 244-T.  
Timber, 460-T, 493-T.  
Tobacco, 162-T, 295-T, 340-T, 419-T.  
Tobago: Forestry, 37-T.  
Tomato, 22-T, 45-T, 81-T, 148-T, 162-T.



Tractors, 408-T, 480-T, 483-T.  
Threshers, 481-T.  
Trinidad: Forestry, 37-T.  
Tripolitania: Land settlement, 149-T.  
Tropical agriculture, congress of, 45-T,  
223-T.  
Tunisia: Agricultural machinery, 92-T,  
444-T; Olive-harvesting, 444-T; Sheep  
breeding, 57-T.

## U

UNION OF SOUTH AFRICA: Cattle farm-  
ing, 454-T; Phosphorite, 124-T.  
United States: Agricultural machinery,  
342-T, 408-T; Agricultural research,  
449-T; Cattle breeding, 7-T, 13-T,  
250-T; Forestry, 229-T, 322-T; Frost  
protection, 121-T; Herd book, 14-T;  
Horse-breeding, 436-T; Lucerne, 80-T;  
Potash salts, 385-T; Tapping, 460-T;  
Tornadoes, 383-T.  
U. S. S. R.: Agricultural machinery,  
481-T; Fruit growing, 81-T; Rubber,  
477-T; Stock breeding, 96-T, 306-T,  
434-T, 482-T.

Uruguay; Butter, 314-T; Carob-tree,  
91-T; Forestry, 373-T; Milk, 313-T,  
363-T; *Pinus Pinea*, 457-T; Slaughter,  
306-T.

## V

Vitamins, 22-T, 443-T.  
Viticulture, 66-T, 108-T, 145-T, 162-T,  
190-T, 249-T.

## W

WATER SUPPLY, 36-T.  
Wheat, 45-T, 65-T, 161-T, 244-T, 386-T,  
421-T.  
Wine production, 66-T, 108-T, 145-T,  
162-T, 190-T, 249-T, 359-T, 403-T.  
Wood preservation, 493-T.  
Wool, 16-T, 350-T, 363-T, 487-T.

## X

X-RAYS, 330-T.

## Y

YUGOSLAVIA: Stock farming, 390-T.

## II.

### INDEX OF NAMES

AGOSTINI A., 156-T.  
Aichele F., 23-T, 226-T.

BAESSMANN F., 365-T.  
Bally W., 129-T.  
Baroni E., 227-T.  
Bigliami P., 149-T.  
Bosman A. M., 454-T.  
Bottnerd J., 106-T.

CABIANCA S., 25-T, 190-T, 408-T, 493-T.  
Cardas A., 24-T.  
Chapman H., 322-T.

DEUCKER C. H., 408-T.  
Dormontal C., 108-T.  
Douarche L., 145-T.  
Driehaus, 365-T.

EHREBARDT P., 189-T.  
Ehrenberg, 151-T.  
Ehrlich C., 454-T.  
Engeler W., 227-T.

FEDERER K., 24-T.

GASSER E., 58-T, 98-T, 181-T.  
Gedroiz K. K., 272-T.

Von Gescher N., 199-T, 287-T.  
Gistl R., 273-T.  
Gleisberg J., 106-T.  
Grasser G., 25-T.

VAN HALL C. J. J., 163-T, 207-T.  
Hann J. von, 270-T.  
Hock A., 64-T.  
Hopfen H. J., 426-T.

JASNY N., 408-T.

KALTENBACH D., 1-T.  
Kühne G., 107-T.  
Legros J., 45-T, 83-T, 223-T, 291-T,  
419-T.  
Lehmann E., 23-T, 226-T.  
Lemmermann O., 296-T, 272-T.  
Lichtenberger B., 492-T.  
Linke F., 23-T.  
Luncz G., 67-T, 108-T, 275-T, 316-T.

MALNIER F., 407-T.  
Mac Hardy D. N., 407-T.  
Mihlaszewski J., 156-T.  
Millan R., 364-T.  
Moskovits E., 173-T, 390-T.  
Münichsdorfer F., 271-T.

NIKLAS H., 64-T.  
von Nostitz A., 273-T.

OPPERMANN A., 461-T.

PASQUAL A., 350-T, 467-T.  
Paulsen K., 107-T.  
Pirovano A., 330-T.  
Powell H. C., 24-T.

RAY G., 327-T, 379-T.  
Regnaudin A., 189-T.  
Robbins W., 364-T.  
Rogni L., 107-T.  
Ruehe H. A., 436-T.  
Ruggiero C., 107-T.

SCHNELLBACH O., 66-T, 139-T.  
Sering M., 149-T.  
Seyffert C., 365-T.  
Sievvert R., 106-T.  
Stampa G., 18-T, 259-T.  
Stang, 273-T.

TALLARICO G., 65-T.  
Taussig S., 7-T, 250-T, 345-T.  
Théry R., 452-T.  
Thomas J. F. H., 24-T.  
Trevisan L., 227-T.

WALLEM N. L., 408-T.  
Weinhausen K., 106-T.  
Will A., 455-T.  
Wilson A. K., 436-T.  
Wirth, 273-T.  
Wellmann O., 298-T.

## PLANT PROTECTION



# INDEX TO THE 'INTERNATIONAL BULLETIN OF PLANT PROTECTION' FOR THE YEAR 1932

## I.

### SUBJECT INDEX.

#### A.

AEGEAN ISLANDS: Crop pests, 5-M. -  
Governatorial Decree of 26 December  
1931 forbidding introduction of plants  
and their parts of citrus, mulberry  
and banana, 11-M.

Algeria: *Anarsia lineatella*, new pest  
of the peach, 202-M. - Decree of 12  
January 1932 regulating the impor-  
tation of plants belonging to the  
Aurantiaceae, 108-M. - *Dociostaurus*  
*maroccanus*, 131-M. - *Phoma flaccida*  
on vine, 201-M. - *Schistocerca gregaria*,  
53-M, 125-M, 141-M.

Anhalt, see Germany, 182-M.

Argentina: Decree of 26 April 1932  
declaring *Chrysomphalus aurantii* to be  
an agricultural pest, 147-M.

Australia: Citrus disease (New) in New  
South Wales, 131-M. - *Emex australis*  
declared noxious weed in Western A.,  
182-M. - *Homeria collina*, *H. miniata*  
and *Watsonia* declared noxious weeds  
in Western A., 26-M. - Quarantine  
Proclamation of 5 May 1932 forbidding  
importation of plants of the genus  
*Humulus*, 206-M.

Austria: *Aspidiotus perniciosus*, 161-M.  
- Decree of 18 July 1932 fixing the  
restrictions on importation and transit  
of plants, 182-M.

#### B.

BAVARIA, see Germany, 146-M.

Belgium: Circular of 27 January 1932  
stating that Ghent is the head-  
quarters of the Belgian Plant Pro-

tection Service, 147-M. - C. of 26  
April 1932 concerning the importation  
of potatoes, tomatoes and egg-plants  
with reference to *Leptinotarsa decem-  
lineata* and *Synchytrium endobioticum*,  
148-M. - Law of 7 August 1931 giving  
effect to the International Convention  
for Plant Protection of 16 April 1929,  
147-M. - Ministerial Decree of 18  
April 1932 concerning *Leptinotarsa*  
*decemlineata*, 110-M. - Ratification  
of the International Convention for  
Plant Protection, 26-M.

Bombay Presidency, see India, 38-M.

Brazil: Ratification of the International  
Convention for Plant Protection of  
16 April 1929, 184-M.

Bremen, see Germany, 109-M.

#### C.

CANADA: Order in Council of 29 March  
1932 concerning *Urocystis tritici* and  
*Taeniothrips gladioli*, 148-M.

Cirenaica: Plant pests, 53-M.

Colombia: 'Reglamentación sanitaria ve-  
getal' of 1932, 132-M.

Committee for the study of locust biology  
at Algiers, 74-M.

Competition (International) for a method  
of controlling the root rot of citrus  
trees, 224-M.

Congresses: C. of the International  
Union of Forestry Research Institutes,  
36-M. - International (VIth) botanical  
C., 124-M. - International (VIth) En-  
tomological C., 224-M. - International  
(XIIth) zoological C., 124-M.

Cuba: 'Resolución' of 12 December 1931 obliging the exporters of fresh plant produce to apply to the Phytopathological Service for the inspection of the produce before packing, 79-M.  
Cyprus: Legislation dealing with plant pests and diseases, 110-M.

Czechoslovakia: Ordinance of 1st February 1932 concerning *Aspidiotus perniciosus*, 152-M. — O. of 22 July 1932 conferring plant protection to definite Institutions, 187-M.

D.

DOMINICAN REPUBLIC: Decree of 25 April 1931 forbidding the importation of paddy, 27-28-M. — D. of 1 May 1931 prohibiting the importation of cassava (*Manihot*) from the Republic of Haiti, 28-M.

E.

EGYPT: Onion white rot disease, 2-M. — *Schistocerca gregaria*, 178-M.

England: Apple Capsid (Essex) Order of 1932, 205-M. — Phytopathological records for the year 1931, 21-M.

Eritrea: *Locusta migratoria* and *Schistocerca gregaria*, 2-M, 37-M, 73-M, 144-M, 178-M, 202-M. — Locusts, 131-M.

Estonia: Order of 20 July 1931 containing the list of products for plant protection to be imported free of customs duty, 26-M.

F.

FINLAND: Mites of the hazel, 4-M.

France: Committee of propaganda for the protection and improvement of crops, 200-M. — Decree of 9 November 1931 creating chairs of plant pathology and agricultural zoology at Nogent-sur-Marne, 27-M. — D. of 8 March 1932 to prevent the introduction of *Aspidiotus perniciosus* from the United States of America, 57-M. — D. of 15 March 1932 concerning the importation of potatoes

grown in zones contaminated with *Lepidolysa decemlineata*, 57-M. — D. of 15 March 1932 modifying the conditions for the admission of imported fruits with reference to the San José scale [*Aonidiella perniciosus*], 58-M. — D. of 8 April 1932 extending the measures against *Aspidiotus perniciosus* to consignments coming from Argentina, South Africa, the Hawaiian Islands and Mexico, 80-M. — D. of 18 April 1932 coming into force the 20 April 1932 forbidding the importation of potatoes, living plants, fresh vegetables, etc., coming from Great Britain, Germany or the Netherlands, 80-M. — D. of 18 April 1932 concerning exceptional importation of seed potatoes when accompanied by a phytosanitary certificate, 80-M. — D. of 21 May 1932 allowing the importation of living plants from the Netherlands, 132-M. — D. of 23 May 1932 authorising the importation of seed potatoes coming from Belgium, 133-M. — D. of 23 May 1932 having come into force the 26 May 1932 forbidding the importation of potatoes, tomatoes and aubergines coming from Belgium, 133-M. — D. of 23 June 1932 extending the measures to prevent introduction of the San José scale to consignments coming from Chile, 133-M. — D. of 2 August 1932 extending the measures to be taken against *Aspidiotus perniciosus* to consignments coming from Austria and Hungary, 167-M. — D. of 12 October 1932 providing for the reorganisation of the Plant Protection Service, 184-M. — D. of 14 October 1932 containing modifications of the regulations of the Decrees of 18 April and 23 May 1932, 206-M. — D. of 19 October 1932 authorising the importation of rhizomes of lily of the valley from Germany, 206-M. — D. of 2 November 1932 extending the provisions relating to *Aspidiotus perniciosus* to consignments coming from Rumania, 206-M.

French North Africa: *Schistocerca gregaria*, 69-M, 125-M.

French West Africa: *Locusta migratoria*, 131-M. — *Schistocerca gregaria*, 141-M, 170-M.

### G.

GERMANY: Decree of 10 October 1931 providing measures for the control of elm disease (*Graphium Ulmi*) in Oldenburg, 25-M. — D. of 7 November 1931 regulating the service of experts in cases of urgency in Prussia, 26-M. — D. of 26 November 1931 concerning prevention of the introduction of *Aspidiotus perniciosus* and *Rhagoletis pomonella*, 25-M. — D. of 30 September 1932 with a view to preventing the introduction of *Tortrix pronubana*, 205-M. — Notification of 25 February 1932 making obligatory the treatment of apple trees against *Psylla mali* and *Fusicladium dendriticum* in the territory of the City of Hamburg, 109-M. — N. of 3 April 1932 concerning the sale of poisons used for plant protection in Mecklenburg-Schwerin, 146-M. — Order of 3 October 1931 to avoid the introduction of *Aspidiotus perniciosus* and *Rhagoletis pomonella*, 24-M. — O. of 16 April 1932 for protecting bees against poisons used for plant protection, 147-M. — O. of 6 June 1932 concerning the use of lead arsenate in the area of Jork, 146-M. — Ordinance of 27 January 1932 for the control of *Eriosoma lanigerum* in Mecklenburg-Schwerin, 109-M. — O. of 2 February 1932 to prevent introduction of diseases and pests of elms and Canadian poplar, 108-M. — O. of 23 February 1932 concerning the introduction of *Leptinotarsa decemlineata* from France, 56-M. — O. of 23 February 1932 making obligatory the destruction of thistles in the territory of the City of Bremen, 109-M. — O. of 21 April 1932 concerning measures to be adopted against elm

disease in Bavaria, 146-M. — O. of 9 May 1932 tending to prevent the spread of *Rhagoletis cerasi* in Saxony 147-M. — O. of 8 July 1932 extending the measures against *Aspidiotus perniciosus* and *Rhagoletis pomonella* to include consignments coming from Austria and Hungary, 182-M. — O. of 14 July 1932 concerning the control of asparagus pests in Anhalt, 182-M. Guatemala: Decree of 4 June 1932 concerning phytosanitary certificates 206-M. — Plant protection measures, 43-M.

### H.

HAMBURG, see Germany, 109-M. Honduras: Lack of measures relating to plant protection, 27-M. Hungary: *Aspidiotus perniciosus*, introduction, spread and control, 162-M. — Decree of 2 May 1932 ordering the obligatory destruction of cockchafer, 111-M. — List of the countries where *Synchytrium endobioticum*, *Leptinotarsa decemlineata*, *Phthorimaea operculella* and *Epithrix cucumeris* have been observed, 111-M. — Ordinance of 8 April regulating the commerce in insecticides, 110-M.

### I.

INDIA: Diseases (New) reported during the year 1931, 22-M. — Fungal diseases (New) in the Punjab, 181-M. — *Leucopetera sphenographa* in the Punjab, 145-M. — *Rhizoctonia bataticola* on sorghum, 38-M. — *Sclerotium rolfsii* on cotton in Bombay, 38-M.

Iraq: Ordinance of 25 February 1932 requiring a certificate of the Plant Protection Service for importation of citrus fruits and vines, 150-M.

Italian Somaliland: Decree of 14 March 1931 instituting a Phytopathological Service, 28-M. — Permission for importation into the Kingdom of Italy of Solanaceous crops produced in the East African Colonies, 44-M. — *Schistocerca gregaria*, 55-M.

Italy: Circular of 12 March 1932 communicating the regulations concerning importation of Italian potatoes in force in European countries, 81-M. — C. of 23 and 28 April 1932 concerning the exportation of potatoes to Hungary and of raw cherries to Germany, 133-M. — C. of 4 July 1932 containing the regulations governing exportation of plants to Argentina, 168-M. — C. of 8 September 1932 containing the rules to be observed in the exportation of plants and fruits to Austria, 207-M. — Communes declared infected with grape phylloxera, 11-M, 111-M, 167-M, 185-M, 207-M. — Decree of 16 February 1932 modifying the technical regulations for the exportation of potatoes, 43-M. — D. of 13 April 1932 reducing the prices of tobacco extract and sulphate of nicotine, 112-M. — D. of 15 July 1932 adding living plants to the list of commodities the importation of which is prohibited, 151-M. — D. of 15 July 1932 concerning sanitary regulations for the importation of seed-potatoes, 151-M. — D. of 20 July 1932 reorganising the Syndicates for olive fly (*Dacus oleae*) control in the province of Palermo, 185-M. — D. of 5 August 1932 of the Prefect of Catania concerning the control of the 'mal secco' of the lemon (*Deuterophoma tracheiphila*), 185-M. — D. of 30 September 1932 concerning exportation of cauliflowers, 207-M. — Decree-law of 19 March 1932 giving effect to the Italo-Austrian Commerce Treaty of 18 February 1932, 111-M. — D.-l. of 19 March 1932 giving effect to the Italian-Hungarian Agreement on Exportation of 23 February 1932, 150-M. — D.-l. of 19 March 1932 giving effect to the Convention of commerce and navigation between Spain and Italy, 58-M. — D.-l. of 19 March 1932 giving effect to the commercial 'Modus vivendi' between Italy and France, 80-M. — D.-l. of 23 June 1932 modifying the law containing enactments

relating to the protection of cultivated plants, 185-M. — Law of 8 February 1932 concerning the reduction of the trade tax on fertiliser and anti-cryptogamic materials, 80-M. — L. of 3 June 1932 concerning the Convention of Commerce and Navigation between Spain and Italy, 167-M. — L. of 8 June 1932 transforming into Law the 'Modus vivendi' between Italy and France of 4 March 1932, 151-M.

# L.

LATVIA: Ordinance of 1st March 1932 giving a list of products for the control of plant diseases which are admitted duty free, 151-M. — Plant diseases observed in 1931, 4-M. — Regulations concerning the control of preparations against plant diseases and pests, 168-M.

Legislative and administrative measures in the following countries: Aegean Islands, 11-M. — Algeria, 108-M. — Argentina, 147-M. — Australia, 26-M, 182-M, 206-M. — Austria, 182-M. — Belgium, 26-M, 110-M, 147-M. — Brazil, 184-M. — Canada, 148-M. — Colombia, 132-M. — Cuba, 79-M. — Cyprus, 110-M. — Czechoslovakia, 152-M, 187-M. — Dominican Republic, 27-M. — England, 205-M. — Estonia, 26-M. — France, 27-M, 57-M, 80-M, 132-M, 167-M, 184-M, 216-M. — Guatemala, 43-M, 206-M. — Germany, 24-M, 56-M, 108-M, 146-M, 147-M, 182-M, 205-M. — G. Anhalt, 182-M. — G. Bavaria, 146-M. — G. Bremen, 109-M. — G. Hamburg, 109-M. — G. Mecklenburg, 109-M, 146-M. — G. Oldenburg, 25-M. — G. Prussia, 26-M. — G. Saxony, 26-M, 147-M. — Honduras, 27-M. — Hungary, 110-M. — Iraq, 150-M. — Italian Somaliland, 28-M, 44-M. — Italy, 11-M, 43-M, 58-M, 80-M, 111-M, 133-M, 150-M, 167-M, 185-M, 207-M. — Latvia, 151-M, 168-M. — Luxembourg, 27-M. — Mexico, 44-M, 81-M. — Morocco



(French), 112-M, 151-M, 168-M, 186-M, 207-M. — Netherlands (The), 151-M, 169-M. — New Zealand, 81-M. — Nicaragua, 27-M. — Panama, 27-M. — Peru, 27-M, 82-M. — Portugal, 44-M, 82-M, 152-M, 187-M. — Rumania, 169-M, — Spain, 26-M, 80-M, 149-M, 164-M, 184-M, 206-M. — Sweden, 82-M, 152-M. — Switzerland (Canton of Vaud), 114-M. — Togoland, 114-M. — Tunisia, 208-M. — Uruguay, 188-M. — Yugoslavia, 11-M, 83-M, 169-M, 210-M.  
Luxemburg: Notice of 24 October 1931 concerning *Synchytrium endobioticum*, 27-M.

#### M.

MADAGASCAR: List of the parasites and diseases of cultivated plants, 105-M.  
Mauretania, see French West Africa, 141-M, 178-M.  
Mecklenburg, see Germany, 109-M, 146-M.  
Meeting (International) for the study of the locust problem, Rome 1931, 6-M.  
Mexico: 'Acuerdo' of 4 December 1931 to prevent the spread of *Anastrepha ludens*, 44-M. — 'Cuarentena Interior Núm. 6' for preventing the spread of Panama disease of bananas, 81-M. — Panama disease of bananas, 24-M.  
Morocco (French): Decree of 30 March 1932 concerning the destruction of sparrows, 112-M. — D. of 14 April 1932 authorising the killing of rabbits by owners or holders of land in the close season, 113-M. — D. of 18 April 1932 containing control measures to be taken against fruit flies, 112-M. — D. of 20 May 1932 authorising owners or holders of lands in certain zones to destroy rabbits in the close season, 151-M. — D. of 28 May 1932 instituting a Commission for the study of "bayoud" of date palms, 151-M. — D. of 10 June 1932 concerning the destruction of *Ceratitis capitata*, 186-M. — D. of 12 August 1932 establishing regulations for the commerce in sulphur, 168-M. — D. of 31 August 1932

regulating importation of plants capable of carrying *Pyrausta nubilalis*, 187-M. — D. of 17 September 1932 authorising owners and holders of land in the territory of Ouezzan to destroy wild boars, 207-M. — D. of 28 September 1932 providing for the organisation of plant protection areas and the nomination of the officials responsible for plant protection, 207-M. — D. of 29 September 1932 requiring that potatoes and tomatoes to be exported to France or Algeria should be free from diseases, 207-M. — *Schistocerca gregaria*, 23-M, 39-M, 54-M, 129-M.

Mycological Society of America, 224-M.

#### N.

NETHERLANDS (THE): Decree of 24 March 1932 for preventing the introduction of *Leptinotarsa decemlineata*, 151-M. — Ratification of the International Convention for Plant Protection of 16 April 1929, 169-M.  
New South Wales, see Australia, 131-M.  
New Zealand: Plants declared noxious weeds in the Otahuhu Borough, 81-M.  
Nicaragua: Importation of previously used sacks forbidden, 27-M.  
North Africa: *Schistocerca gregaria*, 1-M, 21-M, 177-M.

#### O.

OLDENBURG, see Germany, 25-M.

#### P.

PANAMA: Absence of measures relating to plant protection, 27-M.  
Persia: Insect pests, 5-M.  
Peru: Decree of 12 August 1931 regulating the importation of living plants, 27-M. — 'Resolución' of 19 November 1931 declaring sugar cane plantations in different districts infested by *Metamasius hemipterus*, 82-M.

Poland: *Puccinia graminis* on wheat, 164-M. — Tests of resistance to potato wart disease, 131-M.

Portugal: Decree of 11 September 1931 forming a permanent Commission for Plant Protection, 44-M. — D. of 6 November 1931 giving new regulations concerning importation of potatoes, 82-M. — D. of 27 April 1932 bringing the importation of potatoes under new plant sanitation measures, 152-M. — List of products for plant protection which may be imported free of duty, 44-M. — Ratification of the International Convention for Plant Protection of 16 April 1929, 187-M.

Prussia, see Germany, 26-M.

Punjab, see India, 145-M, 181-M.

## R.

RECENT BIBLIOGRAPHY: 12-M, 28-M, 45-M, 59-M, 83-M, 114-M, 133-M, 153-M, 170-M, 188-M, 210-M. (See also the special list of authors mentioned under the heading 'Recent Bibliography' of the *Bulletin*).

## S.

SAXONY, see Germany, 147-M.

Soil insecticides for the treatment of rooted azaleas, 40-M.

Spain: Decree of 18 February 1932 fixing conditions for the exportation of potatoes, 80-M. — D. of 16 June 1932 concerning the control of diseases and pests of the olive tree, 164-167-M. — D. of 1st August 1932 approving the regulations governing the Instituto Forestal de Investigaciones y Experimentaciones, 184-M. — 'Orden' of 18 November 1931 concerning importation of mushroom spawn (*Agaricus campestris*), 26-M. — 'O.' of 20 April 1932 giving a list of insects and diseases not to be allowed to enter Spain in imported products, 149-M. — 'O.' of 13 May 1932 approving the Regulations

for the Committee for Medicinal Plants, 150-M. — 'O.' of 6 October 1932 concerning the importation of potatoes for seed, 206-M.

Sweden: Notification of 8 March 1932 indicating the products used for plant protection, which are regarded as poisons of the second class, 152-M. — Royal Order of 16 October 1931 according certain phytosanitary facilities for the importation of living plants coming from Germany, 82-M.

Switzerland: Law of 22 March 1932 concerning the protection of fruit trees against *Eriosoma lanigerum* and *Viscum album* in the Canton of Vaud, 144-M. — Potato wart disease, 5-M.

## T.

TASMANIA: *Sminthurus viridis*, 6-M.

Togoland: Ministerial Decree of 13 February 1932 regulating control measures against the coffee berry borer, 114-M. — M. d. of 13 February 1932 concerning the protection of cacao plantations, 114-M.

Tripolitania: *Schistocerca gregaria*, 145-M.

Tunis: Decree of 11 July 1932 containing regulations for plant protection, 208-M. — *Schistocerca gregaria*, 128-M, 143-M.

## U.

UNITED STATES OF AMERICA: *Aplanobacter stewartii* causing an epidemic disease of maize, 203-M. — Diseases of peanuts, 22-M. — Diseases of small fruits, 73-M. — Diseases of trees, 3-M. — Strawberry dwarf caused by *Aphelenchus fragariae*, 3-4-M. — Tobacco downy mildew, 180-M. — Reappearance of this disease in Georgia, 38-M.

Uruguay: Order of 19 May 1932 concerning the charges for ant destruction, 188-M. — O. of 16 June 1932 declaring *Ceratitis capitata* and *Anastrepha fraterculus* agricultural pests, 188-M.

V.

VAUD, Canton of, see Switzerland, 114-M.

W.

WALES, see England, 21-M.

Western Australia, see Australia, 26-M,  
182-M.

Y.

YUGOSLAVIA: Decree of 22 April 1932  
authorising the Phytopathological Sta-  
tion of Sarajevo to inspect imported

plants, 170-M. — Order of 24 December  
1931 submitting imported apples and  
pears to phytopathological control,  
83-M. — Ordinance of 2 April 1932  
regulating seed control, 169-170-M. —  
Regulation of 9 November 1931 pre-  
scribing all consignments of plants or  
plant parts to be accompanied by a  
phytosanitary certificate, 11-M. — R. of  
9 November 1931 concerning the im-  
portation and transit of potatoes, 12-M.  
— R. concerning control of the im-  
portation and transit of flowers, 210-M.

II.

ALPHABETICAL LIST OF COLLABORATORS.

(OFFICIAL CORRESPONDENTS FOR PLANT PROTECTION TO THE INTERNATIONAL  
INSTITUTE OF AGRICULTURE).

ADLE AHMED H., 5-M.

BAKÓ, G., 162-M.

BALLARD, E., 2-M.

BIOLOGISCHE REICHSANSTALT FÜR LAND-  
UND FORSTWIRTSCHAFT [GERMANY],  
25-M, 56-M, 109-M, 146-M, 147-M,  
182-M.

BOURIQUET, G., 105-M.

CHARLIERS, N., 40-M.

CHRISTIAN, J., 201-M.

DAMPF, ALFONSO, 24-M, 44-M.

DE BENEDICTIS, A., 2-M, 37-M, 73-M,  
131-M, 144-M, 178-M.

DELIASSUS, 54-M, 202-M.

DESSY, FRANCESCO, 6-M, 11-M.

EGLITS, M., 4-M.

FERRANT, V., 27-M.

GARBOWSKI, L., 131-M, 164-M.

GIBSON, ARTHUR, 148-M.

GENERAL GOVERNMENT OF ALGERIA, 1-M,  
21-M, 53-M, 69-M, 74-M, 89-M, 125-M,  
131-M, 141-M, 177-M, 178-M.

GOVERNMENT OF ITALIAN SOMALILAND,  
44-M.

GOVERNMENT OF TRIPOLITANIA, 145-M.

GUIDOTTI, R., 55-M, 203-M.

HUSAIN, M. AFZAL, 145-M.

ITALIAN MINISTRY FOR THE COLONIES,  
6-M, 145-M.

KRÜGER, G., 53-M.

LIRO, IVAR J., 4-M.

LUTHRA, RAI SAHIB, 181-M.

MCRAE, W., 22-M.

MINISTRY OF AGRICULTURE OF EGYPT,  
178-M.

MINISTRY OF AGRICULTURE AND FISH-  
ERIES [ENGLAND], 21-M.

NEUWEILER, E., 6-M.

NOBLE, R. J., 131-M.

RÉGNIER P., 23-M, 39-M, 54-M.

SCHERLINK, H., 40-M.

STEVENS, NEIL E., 3-M, 22-M, 38-M,  
73-M, 180-M, 203-M.

UPPAL, B. N., 38-M.

WAHL, BRUNO, 161-M.

WARD, F. E., 6-M.

YOSSIFOVITCH, MLADEN, 11-M.

III.

ALPHABETICAL LIST OF AUTHORS  
MENTIONED UNDER THE HEADING 'RECENT  
BIBLIOGRAPHY' OF THE *BULLETIN*.

- ABBOT, E. V., 28-M, 45-M.  
Acker, W., 83-M.  
Adams, J. F., 188-M.  
Afritsch, Josef, 101-M.  
Agati, Julian A., 12-M, 45-M.  
Alben, A. O., 153-M.  
Alcaraz, E., 28-M, 29-M.  
Alcock, N. L., 28-M.  
Aldaba, Vicente C., 12-M, 13-M  
Allen, T. C., 153-M.  
Andersen, K. Th., 59-M.  
André, Marc, 188-M.  
Andreini, Corrado, 83-M.  
Andrewartha, H. G., 114-M.  
Andrews, E. A., 29-M, 59-M.  
Antokolskaia, M. P., 101-M.  
Appel, 188-M.  
Appel, O., 83-M, 114-M, 121-M.  
Appel, Otto, 59-M.  
Arango, Oscar, 190-M.  
Araya, Julio, 153-M.  
Aristow, M. T., 13-M.  
Arnaud, G., 13-M, 101-M, 210-M.  
Arnaud, Gabriel, 153-M.  
Arnaud, Madeleine, 153-M.  
Arnaudi, C., 29-M.  
Ashcroft, J. M., 101.  
Astruc, H., 154-M.  
Atherton, D. O., 59-M.  
Austin, G. D., 101-M.  
Austin, M. D., 211-M.  
Averna Saccà, Rosario, 101-M.  
Ayyar, T. V. Ramakrishna, 211-M.  
  
BADOUX, H., 115-M, 188-M.  
Bagnoli, E., 140-M.  
Baker, C. F., 59-M.  
Bain, Henry, 35-M.  
Balachonov, P. I., 101.  
Balachowsky, A., 45-M, 115-M.  
Bald, J. G., 65-M.  
  
Bally, W., 188-M.  
Bandini, Mario, 83-M, 154-M.  
Banga, O., 29-M.  
Banti, Adolfo, 45-M.  
Barat, H., 83-M.  
Barbey, A., 59-M.  
Barcellos Fagundes, Nestor, 83-M.  
Barthelet, J., 101-M.  
Basinger, A. J., 101-M.  
Bassi, Edoardo, 101-M.  
Bawden, F. C., 115-M, 120-M.  
Bayles, B. B., 46-M.  
Beeson, C. F. C., 29-M.  
Bellini, G., 29-M.  
Bellio, G., 45-M, 102-M.  
Beneyto, R., 28-M.  
Beneyto, Sanchis R., 28-M.  
Benitez, J., 13-M, 29-M.  
Benlloch, Miguel, 83-M, 154-M.  
Beran, F., 134-M.  
Bernes, J., 189-M.  
Berro Aguilera, Jesús M., 59-M.  
Berry, Paul A., 191-M.  
Bertolini, Fausta, 154-M.  
Bertolini, R., 211-M.  
Bhalla, Hem Raj, 47-M.  
Billaudelle, L., 189-M.  
Biologische Reichsanstalt für Land-  
und Forstwirtschaft in Berlin-Dahlem,  
115-M.  
Biourge, Ph., 154-M.  
Bisby, G. R., 155-M.  
Blattný, Ctibor, 155-M, 189-M.  
Blunck, Hans, 13-M, 211-M.  
Bodenheimer, F. S., 115-M, 155-M.  
Bonaventura, G., 83-M.  
Bonaventura, Gustavo, 189-M.  
Bondar, Gregorio, 13-M.  
Bongini, V., 155-M, 189-M.  
Bongini, Virginia, 29-M.  
Boni, Giglio, 189-M.  
Böning, Karl, 29-M.

Bonne, C., 102-M.  
 Bordas, J., 216-M.  
 Borg, John, 102-M.  
 Börner, Carl, 189-M.  
 Bortels, H., 19-M, 67-M.  
 Boselli, F. B., 189-M.  
 Bottini, E., 45-M.  
 Bouhelier, R., 102-M, 190-M.  
 Boutaric, Augustin, 155-M, 189-M.  
 Bouvier, E. L., 29-M.  
 Bovey, P., 61-M, 115-M, 157-M, 192-M.  
 Brammanis, L., 60-M.  
 Bratley, C. O., 211-M.  
 Bredemann, G., 211-M.  
 Bredo, H.-J., 29-M, 189-M.  
 Bremer, H., 29-M, 102-M.  
 Bressman, E. N., 102-M, 211-M.  
 Briggs, Fred N., 211-M.  
 Brindley, T. A., 60-M.  
 Brooks, Charles, 211-M.  
 Brown, Harold D., 115-M.  
 Brown, Nellie A., 155-M.  
 Bruner, S. C., 190-M.  
 Bruneteau, J., 190-M.  
 Bruneteau, Jean, 29-M.  
 Brunn, G., 13-M.  
 Bryan, Jr., E. H., 13-M.  
 Bryan, H., 115-M.  
 Bryan, Mary K., 102-M, 190-M.  
 Bua, Gaetano, 102-M.  
 Buisman, Christine, 60-M, 67-M, 190-M.  
 Buisman, C. J., 60-M.  
 Bunting, R. H., 211-M.  
 Burke, Edmund, 102-M.  
 Burke, H. E., 190-M.  
 Burkholder, Walter H., 45-M, 190-M.  
 Burr Sydney, 60-M.  
 Burrell, R. W., 14-M.  
 Burt, Edward Angus, 60-M.  
 Butler, E. J., 155-M.

CADORET, Arthur, 29-M, 155-M, 211-M.  
 Cairns, Hugh, 218-M.  
 Cambonie, L., 190-M.  
 Candura, G. S., 60-M, 115-M.  
 Capucci, Carlo, 190-M.  
 Carmin, J., 14-M.  
 Carimini, Mario, 29-M, 102-M.  
 Carré, G., 60-M.

Cartwright, K. St. G., 60-M.  
 Castellano, José C., 60-M.  
 Catoni, G., 102-M.  
 Cayley, D. M., 102-M.  
 Celino, M. S., 35-M.  
 Chabrolin, Ch., 14-M, 60-M, 115-M.  
 Chamberlain, E. E., 14-M, 211-M.  
 Chan, Kwai Shang, 46-M.  
 Chappellier, A., 83-M.  
 Charpentier, Charles, 46-M.  
 Chavent, Guillaume, 191-M.  
 Chaudhuri, H., 102-M.  
 Cheema, G. S., 20-M.  
 Chenon, P., 14-M.  
 Chevalier, Aug., 14-M, 191-M.  
 Chiappelli, R., 29-M, 115-M, 191-M.  
 Chiaromonte, A., 212-M.  
 Chiaromonte, Alfonso, 83-M, 84-M.  
 Christensen, J. J., 30-M.  
 Ciferri, R., 212-M.  
 Claus, J., 155-M.  
 Clausen, C. P., 14-M.  
 Clausen, Curtis, P., 191-M.  
 Clayton, E. E., 115-M.  
 Clements, Frederic E., 156-M.  
 Cocchi, F., 14-M.  
 Cochran, L. C., 212-M.  
 Coffmann, F. A., 46-M.  
 Cole, J. R., 153-M.  
 Colizza, Corrado, 156-M.  
 Colon, Edmundo D., 212-M.  
 Colony and Protectorate of Kenya. Department of Agriculture, 84-M.  
 Commun, R., 212-M.  
 Compere, Harold, 116-M.  
 Consiglio Nazionale delle Ricerche [Italy], 85-M.  
 Cooley, J. S., 103-M, 211-M.  
 Cooley, L. M., 103-M.  
 Copeland, Edwin Bingham, 85-M.  
 Corbett, G. H., 212-M.  
 Cormier, P., 116-M.  
 Corneli, E., 30-M, 60-M.  
 Corner, E. J. H., 212-M.  
 Cornu, Ch., 212-M.  
 Costantin, J., 103-M, 116-M, 213-M.  
 Costantino, G., 85-M.  
 Cotter, Ralph U., 191-M, 213-M.  
 Cottrell-Dormer, W., 61-M.  
 Courtler, E. A., 191-M.

Cox, James A., 191-M.  
Craig, Lyman C., 61-M.  
Craigie, J. H., 46-M.  
Crebert, H., 213-M.  
Criddle, Norman, 103-M, 116-M.  
Cummins, George B., 103-M.  
Cunningham, G. H., 61-M, 116-M, 156-M.  
Curini-Galletti, A., 30-M.  
Currie, G. A., 156-M.  
Currie, J. F., 67-M, 224-M.  
Curzi, M., 14-M, 61-M, 85-M, 157-M.  
Cuscianna, N., 14-M.

D'AMARAL DIAS, Felix, 46-M.  
Daniel, Derrill MacCollough, 191-M.  
Danser, B., 14-M.  
Davidson, James, 116-M.  
Davies, Maldwyn W., 224-M.  
Davis, E. G., 67-M.  
Dawson, Paul R., 61-M.  
De Azevedo Marques, Luiz A., 213-M.  
De Fluiter, H. J., 15-M.  
Defrance, Ph., 191-M.  
Delassus, 46-M.  
De Lépiney, J., 191-M.  
Della Beffa, G., 15-M, 192-M.  
De Marzi, Guido, 192-M.  
De Montero, Fernando, 213-M.  
De Ong, E. R., 213-M.  
De Urries y Azara, Manuel J., 213-M.  
Desai, M. K., 175-M.  
De Tomasi, J. A., 46-M.  
De Vin, Th. J., 213-M.  
De Zulueta, Antonio, 213-M.  
Diddens Harmanna, A., 46-M.  
Diffloth, P., 103-M.  
Di Lorenzo, Salvatore, 15-M.  
Dippenaar, B. J., 103-M.  
D'Ippolito, G., 192-M.  
Direction Générale de l'Agriculture, du  
Commerce et de la Colonisation. Dé-  
fense des cultures [Morocco], 30-M.  
Dodge, B. O., 61-M.  
Doladilhe, Maurice, 155-M, 189-M.  
D'Oliveira, Branquinho, 103-M.  
Donandt, Siegfried, 192-M.  
Dongé, E., 103-M.  
Doorenbos, S. G. A., 67-M.  
Dover, Cedric, 192-M.

Draghetti, A., 192-M.  
Drago, A., 157-M.  
Drago, Antonino, 192-M.  
Drayton, F. L., 224-M.  
Dronkin, I. F., 46-M.  
Dufrenoy, J., 30-M, 213-M.  
Dufrenoy, Jean, 30-M.  
Du Plessis, S. J., 223-M.  
Durand, G., 61-M.

EAST, E. M., 46-M.  
Economic Advisory Council. Committee  
on Locust Control [Great Britain],  
157-M.

Edgerton, C. W., 67-M.  
Edwards, E. E., 61-M.  
Edwards, E. T., 116-M.  
Ehrlich, John, 104-M.  
Eidmann, H., 104-M.  
Elayda, Aniano, 13-M.  
Eliescu, Grigore, 61-M.  
Elliott, Charlotte, 104-M.  
Ernst, Fritz, 15-M.  
Esau, Katherine, 136-M.  
Escherich, K., 15-M, 133-M.  
Esmarch, F., 157-M.  
Estados Unidos Mexicanos. Secretaría de  
Agricultura y Fomento, 85-M.  
Estève, G., 61-M.  
Estiot, P., 103-M.  
Ewan, J. W., 19-M.  
Ezechiél, Walter N., 61-M.

FABRIZIO, P., 61-M.  
Faes, H., 61-M, 85-M, 157-M, 192-M,  
213-M.  
Fahmy, Tewfik, 30-M.  
Fahringer, Josef, 61-M.  
Fajardo, T. G., 116-M.  
Faris, James A., 46-M.  
Faure, Jacobus C., 192-M.  
Fawcett, G. L., 61-M.  
Feistritz, W., 88-M.  
Felcini, A., 15-M.  
Fenaroli, L., 133-M.  
Ferraris, T., 30-M.  
Feucht, Werner, 46-M.  
Feytaud, J., 15-M, 192-M, 214-M.  
Picke, C. H., 64-M.

Fife, J. M., 134-M.  
Fikry, A., 30-M.  
Fink, David E., 214-M.  
Fiore, Maria, 85-M.  
Fiori, A., 116-M.  
Fischer, R., 15-M.  
Fischer, Robert, 134-M.  
Fisher, D. F., 62-M.  
Fisher, Ronald C., 62-M.  
Fitzpatrick, Harry Morton, 30-M.  
Flachs, K., 30-M.  
Fleck, Wilhelm, 192-M.  
Flor, H. H., 62-M, 214-M.  
Fluke, C. L., 134-M.  
Folsom, 193-M.  
Forward, Dorothy F., 157-M.  
Franchini G., 15-M.  
Foister, C. E., 28-M, 30-M.  
Fransen, J. J., 193-M.  
Frappa, Cl., 15-M, 46-M.  
Frémont, Th., 30-M.  
Friedrichs, G., 134-M, 193-M.  
Friederichs, K., 62-M.  
Frost, Kenneth R., 116-M.  
Fryer, J. C. F., 60-M.  
Fuller, Harry, J., 116-M.  
Fulmek, L., 193-M.  
Fuschiini, C., 31-M.

GAINES, E. F., 214-M.  
Gamba, Pericle, 62-M.  
Ganossis, B., 214-M.  
Gante, Th., 46-M.  
Garbowski, L., 116-M, 117-M.  
García Mercet, Ricardo, 16-M, 47-M.  
Gard, M., 134-M.  
Gardner, C. A., 117-M.  
Garrett, S. D., 221-M.  
Gassner, G., 31-M, 85-M, 158-M.  
Gaudineau, 210-M.  
Geach, W. L., 117-M.  
Gersdorff, W. A., 85-M.  
Ghimpu, V., 31-M, 47-M, 117-M.  
Gibbs, J. G., 117-M.  
Gil, Collado J., 62-M.  
Gillhatt, F. C., 134-M.  
Gimingham, G. T., 214-M.  
Ginet, J., 214-M.

Ginsburg, Joseph M., 62-M.  
Gioelli, Felice, 193-M.  
Gleisberg, W., 16-M, 31-M, 134-M, 193-M.  
Glendon, Hill, A., 134-M.  
Goetze, G., 47-M, 85-M, 86-M, 193-M.  
Goffart, H., 134-M.  
Goidanich, Athos, 16-M, 158-M.  
Gomez Clemente, Federico, 158-M.  
Gomez-Menor, O. Juan, 193-M, 214-M.  
Gonçalves Carneiro, João, 214-M.  
Gonzales, Salustiano S., 158-M.  
Goodey, T., 193-M.  
Goritzkij, O. V., 47-M, 49-M.  
Goulden, C. H., 62-M.  
Grabner, L. F., 134-M.  
Grant, D. H., 137-M.  
Grant, Theodore J., 194-M.  
Gray, W. G., 62-M.  
Greco, Nunzio, 197-M.  
Green, D. E., 214-M.  
Gregor, Mary J. F., 214-M.  
Gregory, P. H., 215-M.  
Grimaldi, C., 160-M.  
Guillochon, L., 62-M.  
Guillochon, R., 62-M.  
Gurski, J. H., 215-M.  
Guterman, E. F., 190-M.

HAASIS, Ferdinand W., 47-M.  
Hähne, Hans, 86-M, 102-M.  
Hamilton, Marion A., 215-M.  
Hamond, J. B., 68-M.  
Hannay, A. M., 31-M.  
Hänni, E., 16-M.  
Harman, S. W., 134-M.  
Harris, R. V., 47-M.  
Hart, J., 86-M.  
Harter, L. L., 62-M.  
Harukawa, Chukichi, 47-M, 158-M.  
Hassebrauk, K., 85-M.  
Hédin, L., 16-M.  
Heim, Roger, 13-M, 62-M, 86-M, 117-M.  
Heinricher, Emil, 62-M.  
Hemmi, Takewo, 117-M.  
Henderson, R. G., 49-M, 62-M.  
Hodson, W. E. H., 158-M, 194-M.  
Hengl, F., 134-M.  
Herbert, Fred W., 134-M.  
Hermans, Herman, 86-M.

- Herrero, Paulino, 31-M.  
Hey, Alfred, 31-M.  
Hieke, F., 215-M.  
Hill, C. C., 31-M.  
Hilli, A., 117-M.  
Hockenyos, Geo. L., 215-M.  
Holmes, Francis O., 215-M.  
Hodson, W. E. H., 194-M.  
Hoehn, Rolf, 31-M.  
Hoffmann, Adolf, 86-M.  
Hoffmann, J. F., 31-M.  
Hoffmann, William, E., 158-M.  
Hopkins, J. C. F., 31-M, 194-M,  
215-M.  
Horn, 16-M.  
Horn, Walter, 47-M.  
Hosny, Mahmoud, 197-M.  
Houben, I., 194-M.  
Howard, L. O., 32-M.  
Hubbard, James W., 134-M.  
Hubert, Ernest E., 158-M.  
Hugues, Albert, 215-M.  
Husain, M. Afzal, 47-M, 194-M.  
Husfeld, Bernhard, 215-M.  
Husz, Béla, 134-M.  
Hutchins, Lee M., 158-M.  
Hutson, J. C., 135-M, 194-M, 215-M.
- IGLESIAS, L., 16-M.  
Ikonen, E. V., 49-M.  
Imms, A. D., 215-M.  
Imperial Bureau of Agricultural Parasitology [England], 135-M.  
Imperial Mycological Institute [England], 135-M.  
Irwin, Geo. R., 215-M.  
Isatshenko, V. B., 47-M, 49-M.  
Issajev, S., 135-M.  
Isshiki, Shigeo, 159-M.  
Ivanoff, B., 216-M.  
Ivanov, S. M., 135-M.
- JACK, Rupert W., 47-M.  
Jacques, Ch., 17-M.  
Jacobi, E. F., 216-M.  
Jancke, O., 32-M, 86-M.  
Janisch, Ernst, 17-M.  
Jarach, Marco, 47-M.
- Jarvis, Hubert, 17-M, 63-M.  
Javoronkova, Irayade P., 135-M.  
Jaynes, H. A., 63-M.  
Jenkins, Anna E., 159-M, 216-M.  
Jennes, J., 135-M.  
Jessen, W., 86-M.  
Joessel, P. H., 216-M.  
Johnson, Ethelbert, 216-M.  
Johnson, E. M., 52-M.  
Johnson, H. W., 63-M.  
Johnson, Howard B., 211-M.  
Johnson, James, 194-M.  
Johnston, H. B., 135-M.  
Johnston, C. O., 64-M.  
Jolles, Philipp, 159-M.  
Jones, Linus H., 135-M.  
Journée C., 159-M.
- KADOCSA, Gy, 159-M.  
Kamat, M. N., 20-M.  
Kannenbergh, Heinrich, 117-M.  
Karpinski, J. J., 159-M.  
Kazanskij, B., 47-M.  
Kéler, S., 117-M.  
Kenneth, M. Smith, 219-M.  
Kernahan, S. P., 32-M.  
Kerr, H. W., 216-M.  
Khan, Abdul Wahid, 194-M.  
Killian, Charles, 63-M.  
King, H. H., 135-M.  
Klan, Zd., 86-M.  
Klebahn, H., 32-M.  
Klein, H. Z., 216-M.  
Klemm, M., 223-M.  
Klemm, M. Nachmals, 86-M.  
Kling, M., 63-M.  
Koch, Karl, 134-M.  
Köck, Gustav, 86-M, 135-M, 159-M.  
Köhler, E., 32-M, 86-M, 121-M.  
Köhler, Erich, 32-M, 63-M.  
Kojima, Toshibumi, 216-M.  
Koller, Raphael, 217-M.  
Kondō, Mantarō, 159-M.  
Kotte, W., 32-M.  
Kottur, G. L., 87-M.  
Kovačević, Ž., 135-M.  
Kozhantshikov, J., 47-M, 135-M.  
Kozikowski, A., 159-M.  
Krzysik, Franciszek, 32-M, 159-M.



Kuhn, J., 87-M, 136-M.  
Kumashiro, Saburō, 47-M, 158-M.  
Kunkel, L. O., 217-M.  
Kuwana, Inokichi, 136-M.

LABES, Bodo, 194-M.  
Labrousse, F., 48-M.  
Lalière, A., 86-M.  
Landucci, Vasco, 217-M.  
Langenbuch, R., 87-M, 118-M.  
Lanuza, Epitacio, 13-M.  
Lanza, Miranda, 87-M, 159-M.  
Larose, E., 159-M.  
Lathrop, F. H., 136-M.  
Laubert, R., 87-M, 121-M, 160-M.  
Lauritzen, J., 194-M.  
Leach, J. G., 136-M.  
Lebedev, A. G., 63-M.  
Le Clerg, E. L., 217-M.  
Lederer, Gustav, 87-M.  
Lecmann, A. C., 63-M.  
Lehmann, Hans, 63-M, 217-M.  
Lendner, Alf., 217-M.  
Le Pelley, Richard H., 136-M, 159-M.  
Lepik, E., 118-M.  
Leplae, Edm., 160-M, 217-M.  
Lequertier, Roger, 118-M, 136-M.  
Lesley, J. W., 17-M.  
Lesne, Pierre, 136-M, 194-M.  
Lester-Smith, W. C., 217-M.  
Leszczenko, P., 116-M, 118-M.  
Levine, Moses N., 213-M.  
Levy, E. Bruce, 118-M.  
Lévy, J., 63-M.  
Lewis, R. D., 153-M.  
Link, George K. K., 119-M, 194-M,  
217-M.  
Long, H. C., 194-M.  
Longrée, Karla, 32-M.  
Lopez, A. W., 48-M, 218-M.  
Loureiro Ferreira, M. J., 136-M.  
Lubischew, A. A., 48-M.  
Lüdtke, Max, 88-M.  
Lugan, Jacques, 195-M.  
Lugard, W. J., 17-M, 63-M.

MACGILL, Elsie I., 63-M, 136-M.  
Mackie, W. W., 136-M.

MacLagan, D. Stewart, 136-M, 160-M.  
Madden, E. A., 118-M.  
Magarinos Torres, A. F., 160-M.  
Magee, C. J., 63-M.  
Mains, E. B., 63-M, 118-M.  
Maire, R., 160-M.  
Maklakova, Galina Ph., 137-M.  
Malbrant, R., 61-M.  
Malenotti, Ettore, 17-M, 33-M, 118-M,  
137-M, 160-M, 195-M.  
Malzev, A. I., 137-M.  
Mallamaire, A., 160-M.  
Mameli, Efisio, 87-M.  
Mango, Achille, 33-M.  
Mannessier-Mameli, Anna, 87-M.  
Manzoni, L., 218-M.  
Marañon, Joaquin, 116-M.  
Maralihalli, S. S., 87-M.  
Marchionatto, Juan B., 137-M, 195-M.  
Marcus, B. Adoli, 63-M.  
Marro, Marco, 137-M.  
Marsais, P., 123-M.  
Marshall, Rush P., 48-M.  
Martelli, Giuseppe M., 64-M, 195-M.  
Martinez Martinez, Miguel, 218-M.  
Martini, Mary L., 118-M.  
Marx, Th., 118-M.  
Massee, A. M., 64-M.  
Matsumoto, Takashi, 48-M, 195-M.  
Mathur, R. N., 118-M.  
Maury, M., 64-M.  
Mayné, R., 88-M, 170-M.  
Mayné Raymond, 170-M.  
Mayne, W. Wilson, 137-M.  
McCallan, S. E. A., 52-M, 224-M.  
McGuire, L. P., 123-M.  
McKay, Robert, 119-M.  
McLean, Lawrence G., 64-M.  
McRae, W., 48-M.  
Mechajlov-Senkevitch, J. M., 48-M.  
Mehta, T. R., 88-M.  
Mémaris, G., 50-M.  
Melchers, Leo Edw., 33-M.  
Melchers, L. E., 64-M, 104-M.  
Melhus, I. E., 197-M.  
Menozzi C., 33-M.  
Menozzi, Carlo, 170-M, 195-M.  
Mentzel, Fr., 134-M, 193-M.  
Mentzel, Friedrich, 195-M.  
Merkenschlager, F., 88-M, 118-M.

Mentzel, F., 16-M, 31-M.  
Mesnil, L., 48-M.  
Metzger, F. W., 137-M.  
Meyer, André, 118-M, 195-M.  
Middleton, A. D., 17-M, 64-M.  
Miestinger, K., 118-M.  
Milan, A., 196-M.  
Milan, Angelo, 33-M.  
Miles Herbert, W., 137-M.  
Miles, L. E., 195-M.  
Millan, Roberto, 195-M.  
Millard, W. A., 67-M.  
Miller, E. V., 211-M.  
Miller, N. C. E., 170-M.  
Miller, Paul, R., 196-M.  
Mimeur, J. M., 191-M.  
Minto, John, 17-M.  
Miyajima, Shikiro, 198-M.  
Monte, Oscar, 118-M, 171-M, 196-M.  
Montemartini, L., 17-M, 218-M.  
Montemartini, Luigi, 218-M.  
Mook, Paul V., 211-M.  
Moreau, L., 119-M.  
Morgan, W. L., 64-M.  
Moritz, Otto, 33-M.  
Morris, H. M., 218-M.  
Morstatt, 33-M.  
Muggeridge, J., 218-M.  
Muller, Albert S., 171-M.  
Münch, E., 121-M.  
Munerati, O., 196-M.  
Munerati, Ottavio, 48-M.  
Murillo, Luis-Maria, 119-M, 218-M.  
Murphy, Paul A., 119-M.  
Muskett, Arthur E., 218-M.  
Muth, 17-M.  
Myers, J. G., 171-M.  
Myslakowski, K., 215-M.  
  
NAGEL, W. 17-M.  
Nägeli, W. 33-M.  
Nahmmacher, Jürgen, 171-M.  
Nance, Nellie, 174-M.  
Naumova, N. A., 137-M.  
Napper, R. P. N., 219-M.  
Natrass, R. M., 33-M, 196-M.  
Neal, D. C., 61-M.  
Neal, David C., 64-M.  
Neatby, K. W., 62-M.

Nemiritskij, B. G., 48-M.  
Nenjukov, D. V., 51-M.  
Neumann, Hugo, 33-M, 64-M.  
Neuweiler, E., 219-M.  
Newcomer, E. J., 137-M.  
Newman, L. J., 219-M.  
Nicholls, H. M., 137-M.  
Nicholson, C., 48-M.  
Nickels, C. B., 136-M.  
Niethammer, Anneliese, 171-M.  
Nisikado, Yosikazu, 48-M, 49-M.  
Nisikawa, Yasaburo, 119-M.  
Novak, P., 33-M.

OCFEMIA, G. O., 49-M.  
Ogloblin, Alejandro A., 196-M.  
Ōno, Minoru, 198-M.  
Oppi, Ercolano, 33-M, 219-M.  
Orian, G., 17-M.  
Oros, Ioan, 119-M.  
Orton, C. R., 196-M.  
Ossowski, Leon, 171-M.

PACK, Dean A., 67-M.  
Pagliano, 219-M.  
Palazzoli, R., 138-M.  
Palm, B., 64-M.  
Palm, B. T., 219-M.  
Palo, Macario A., 119-M.  
Paoli, Guido, 88-M, 172-M.  
Paoloni, Bernardo, 196-M.  
Pape Heinrich, 34-M, 121-M.  
Parievskaia, A. P., 138-M.  
Parisi, Rosa, 88-M.  
Parisi, Ottavio, 172-M.  
Pasinetti, L., 196-M.  
Pasquier, 46-M.  
Passalacqua, Tito, 64-M.  
Passy, Pierre, 17-M.  
Pastac, L., 199-M.  
Pavavino, G. L., 49-M, 50-M.  
Pavarino, Giovanni Luigi, 50-M.  
Pearson, G. A., 64-M.  
Pearson, Norma L., 34-M.  
Peklo, J., 138-M.  
Percival, W. Clement, 64-M.  
Perrot, Em., 34-M, 138-M.

Persons, T. D., 195-M.  
Pescott, R. T. M., 219-M.  
Petch, T., 219-M.  
Péterfi, Tibor, 172-M.  
Pethybridge, Geo. H., 219-M.  
Petit, Gabriel, 220-M.  
Petri, L., 17-M, 18-M, 172-M, 196-M,  
220-M.  
Petrov, A. D., 49-M.  
Pettinger, N. A., 49-M.  
Peuser, Hans, 34-M.  
Pfeffer, A., 64-M.  
Picado, C., 49-M.  
Pickles, Alan, 172-M.  
Pierstorff, A. L., 196-M.  
Pictre, Maurice, 155-M, 189-M.  
Pittman, H. A., 119-M, 220-M.  
Plaut, Menko, 88-M.  
Poli, P., 34-M.  
Poniatowska, Halina, 224-M.  
Poos, F. W., 66-M.  
Porter, D. R., 65-M, 197-M, 220-M.  
Potapov, A., 138-M.  
Prasad, Hari Har, 49-M.  
Prell, H., 65-M.  
Preti, Giacomo, 119-M.  
Price, W. C., 220-M.  
Priego, J. Manuel, 197-M.  
Priesner, H., 34-M, 65-M, 197-M.  
Prisiashnuk, A. A., 138-M.  
Provasoli, Luigi, 172-M.  
Přstross, 18-M, 138-M.  
Puecher Passavalli, L., 50-M, 138-M.  
Puecher Passavalli, Luigi, 18-M., 34-M.  
Pussard, R., 34-M.  
Pussard-Radulesco, E., 18-M.

QUANJER, H. M., 34-M.

RABIEN, H., 220-M.  
Rabinovitz Sereni, P., 18-M, 50-M,  
172-M, 173-M.  
Racah, Vittorio, 197-M.  
Radeloff, H., 211-M.  
Rademacher, Bernhard, 88-M.  
Ragionieri, A., 18-M.  
Ramakrishna Ayyar, T. V., 65-M.  
Rammul, P., 220-M.  
Ramón y Acosta, Domingo, 50-M, 197-M.

Ramsey, Glen B., 119-M, 139-M, 217-M.  
Rant, A., 50-M.  
Raphael, T. D., 122-M.  
Ravaglioli, T., 197-M.  
Rayss, T., 65-M, 139-M.  
Reinboth, Gerhard, 220-M.  
Rinaldi Ceroni, Rinaldo, 220-M.  
Robertson, H. F., 220-M.  
Rodenhiser, H. A., 65-M, 221-M.  
Razouls, Pierre, 197-M.  
Reckendorfer, P., 134-M.  
Reddick, Donald, 173-M.  
Reeves, E. L. A., 62-M.  
Reichert, Alex, 139-M.  
Reincke, R., 65-M.  
Reitsma, J., 173-M.  
Rekatch, V. N., 139-M.  
Reynolds, E. B., 61-M.  
Richardson, C. H., 60-M.  
Richter, H., 20-M, 121-M, 200-M.  
Riker, A. J., 153-M.  
Ripper, Walter, 86-M.  
Rivera, Vincenza, 88-M.  
Roark, R. C., 139-M.  
Robertson, H. T., 120-M.  
Rocci, Ubaldo, 139-M.  
Roeser, Jacob, 139-M.  
Rogai, F., 88-M.  
Roldan, E. F., 34-M.  
Roncoroni, Ettore, 197-M.  
Ross, Hermann, 34-M.  
Rossi, P., 88-M.  
Rossi, Vincenzo, 120-M.  
Roussopoulos, N., 50-M.  
Roxas, Manuel L., 50-M.  
Rui, Dino Bernardo, 120-M, 197-M.  
Russo, G., 173-M.  
Russo, Giuseppe, 34-M, 65-M.  
Ruttledge, W., 135-M.  
Růžicka, Jaroslav, 65-M.  
Ryabov, M. A., 139-M.

SABV, J., 65-M.  
Salaman, Redcliffe, 120-M.  
Salmon, E. S., 221-M.  
Salt, George, 173-M.  
Šámal, Jaromir, 139-M.  
Sampietro, G., 35-M.  
Samuel, Geoffrey, 65-M, 173-M, 221-M.

- Sanchis, R. Beneyto, 13-M.  
Sanderson, E. Dwight, 65-M.  
Sandhack, Herm A., 19-M.  
Sansone-Capogrosso, A., 19-M, 35-M.  
Saulnier, J.-M., 197-M.  
Savastano, Giulio, 174-M.  
Saveljev, A. I., 50-M.  
Saveljef, A. O., 49-M.  
Savenkov, A. N., 63-M.  
Săvulesco, Tr., 35-M, 139-M.  
Schaeffler, 59-M.  
Schaffnit, Ernst, 35-M, 88-M.  
Scheinkin, D., 14-M.  
Scheuermann, W., 120-M.  
Schick, R., 221-M.  
Schilcher, Erich, 65-M, 221-M.  
Schleusener, W., 47-M.  
Schmidt, E., 221-M.  
Schmidt, E. W., 88-M.  
Schreiber, Fritz, 139-M.  
Schüpfer, Vincenz, 120-M.  
Schwartz, G., 139-M.  
Schwerdtfeger, F., 13-M, 66-M, 221-M.  
Scofield, Carl S., 66-M.  
Scurti, F., 50-M.  
Scurti, Francesco, 50-M.  
Seeger, M. 120-M.  
Sempio, Cesare, 35-M, 174-M.  
Sering, Max, 50-M.  
Servadei, Antonio, 174-M.  
Servazzi, O., 35-M, 139-M, 174-M.  
Service Technique Agricole de la Compagnie Cotonnière Congolaise, 19-M.  
Seto, Fusataro, 120-M.  
Sgaravatti (Frat.), 16-M.  
Sharpless, A., 120-M.  
Shear, C. L., 35-M.  
Shear, Cornelius L., 156-M.  
Sheffield, F. M. L., 66-M.  
Shitikova-Russakova, A. A., 121-M.  
Skalov, G. G., 121-M.  
Sibilia, Cesare, 66-M, 174-M.  
Sicard, H., 221-M.  
Sideris, C. P., 35-M.  
Siemaszko, Janina, 66-M.  
Siemaszko Wincenty, 66-M.  
Sigrianskij, N. D., 50-M.  
Silvestri, F., 221-M.  
Simmonds, H. W., 221-M, 222-M.  
Simmonds, J. H., 66-M.  
Sindacato Nazionale Fascista [dei] Tecnici Agricoli, [Italy], 198-M.  
Sitowski, Ludwik, 121-M.  
Slater, A., 66-M.  
Small, T., 198-M.  
Smith, Clayton O., 51-M.  
Smith, Floyd F., 66-M.  
Smith, H. D., 31-M.  
Smith, Harry S., 116-M.  
Smith, Kenneth, M., 19-M.  
Smith, Noel J. G., 222-M.  
Smith, R. W., 46-M.  
Smith, Roger C., 19-M.  
Smith, W. K., 214-M.  
Smith, William K., 222-M.  
Snyder W. C., 121-M.  
Sokal, N., 154-M.  
Sokovnin, N. I., 51-M.  
Somazawa Kôetsu, 48-M, 195-M.  
Sondak, I., 121-M.  
Sountag, K., 51-M.  
Sorauer, Paul, 35-M, 121-M.  
Soriano, S., 19-M.  
Spangenberg, Jorge, 121-M.  
Speyer, W., 121-M.  
Sprague, Roderick, 198-M.  
Sprangers, A. A. C., 198-M.  
Sprengel, L., 19-M, 51-M, 121-M, 198-M.  
Staehelin, M., 157-M.  
Stahel, Gerold, 35-M, 174-M.  
Staner, P., 198-M.  
Stanton, T. R., 46-M.  
Stapp, C., 19-M, 51-M, 66-M.  
Stein, Emmy, 174-M.  
Stepanov, V. F., 49-M.  
Stevens, F. L., 35-M.  
Stevens, Neil E., 35-M, 139-M, 174-M.  
Stirrup, H. H., 19-M.  
Stolze, Karl Viktor, 19-M.  
Stoughton, R. H., 66-M.  
Straib, W., 31-M.  
Stranak, Fr., 140-M.  
Stratshitzkij, K., 51-M.  
Strong, Forrest C., 51-M.  
Strong, Miriam C., 51-M.  
Succi, Antonio, 137-M.  
Sundararama Ayyar, S., 66-M.  
Supper, Reinhold, 174-M.  
Swezey, O. H., 19-M, 67-M.  
Sydow, H., 222-M.

TAKAHASHI, Ryoichi, 51-M, 122-M.  
Takato, Ryôiti, 47-M.  
Takei, Sankichi, 198-M.  
Tan, José, 45-M.  
Tapke, V. F., 20-M, 46-M, 222-M.  
Tareev, A. L., 51-M.  
Tattersfield, F., 67-M, 122-M.  
Taylor, T. H. C., 222-M.  
Terranova, Carmelo, 122-M.  
Thaxter, Roland, 198-M.  
Thein, Ba., 220-M.  
Thénard, J., 51-M.  
Thiem, H., 36-M, 122-M, 140-M.  
Thomas, P. H., 122-M.  
Thomsen, Math, 222-M.  
Tiins, E. C., 67-M.  
Titta, G., 140-M.  
Tobler, Friedrich, 67-M.  
Tomas, Roger, 199-M.  
Tompkins, C. M., 67-M.  
Tomson, R., 122-M.  
Topi, Mario, 222-M.  
Tornow, Elisabeth, 174-M.  
Torti, Mario, 199-M.  
Touze, A., 222-M.  
Travaini, V., 140-M.  
Travassos, Lauro, 199-M.  
Traverso, G. B., 122-M.  
Trochain, J., 122-M.  
Trouvelot, B., 51-M, 123-M.  
Trouvelot, Bernard, 222-M.  
Truffaut, Georges, 199-M.  
Trujillo Peluffo, A., 51-M.  
Trujillo Peluffo, Agustín, 140-M.  
Truscott, J. H. L., 123-M.  
Tucker, C. M., 51-M.  
Turner, D. M., 67-M.

UGRJUMOV, G., 52-M.  
Uichanco, Leopoldo B., 52-M.  
Unamuno, Luis M., 36-M.  
Union Général des Associations Agricoles,  
Caisse centrale d'assurances mutuelles  
du Maroc, 199-M.  
United States Department of Agriculture,  
Plant Quarantine and Control Admini-  
stration, 20-M.  
Uphof, J. C. Th., 20-M.  
Uppal, B. N., 20-M 175-M, 176-M.

Urban, Jar., 175-M.  
Uvarov, B. P., 175-M.

VALLEAN, W. D., 51-M.  
Van Beyna Thoe Kingma, F. H., 20-M.  
Van den Bruel, Walther, 170-M.  
Van der Goot, P., 222-M.  
Van der Meer Mohr, J. C., 199-M.  
Van Dillewijn, C., 199-M.  
Van Hell, W. F., 20-M.  
Van Leeuwen, E. R., 68-M.  
Van Poeteren, N., 123-M, 222-M.  
Vanterpool, T. C., 123-M.  
Vayssière, P., 67-M, 175-M.  
Vayssière, Paul, 117-M, 175-M.  
Vecchi, Anita, 20-M.  
Veitch, Robert, 67-M, 223-M.  
Venkatarayan, S. V., 123-M.  
Vernon, T. R., 20-M.  
Verona, O., 140-M.  
Verplancke, G., 175-M.  
Verplanche, Germain, 20-M.  
Verwoerd, Len, 223-M.  
Viala, P., 123-M.  
Vinet, E., 119-M.  
Vivarelli, Luigi, 175-M, 199-M.  
Voglino, P., 20-M, 36-M, 140-M, 175-M,  
199-M.  
Voglino, Piero, 175-M, 176-M  
von Tubeuf, 52-M, 223-M.  
von Winning, Erika, 36-M, 223-M.  
Voukassovitch, Pavlé, 176-M.  
Vyshelskij, N. S., 52-M.

WAGNER, F. A., 104-M.  
Wahl, Bruno, 200-M.  
Wahlen, F. T., 123-M.  
Walker, M. N., 52-M.  
Walton, A., 176-M.  
Wardlaw, C. W., 67-M, 123-M.  
Ware, W. M., 221-M.  
Watzl, Otto, 67-M.  
Weber, George F., 52-M, 200-M.  
Wehsarg, Otto, 36-M.  
Wellman, F. L., 223-M.  
Werneck, H. L., 123-M.  
Werner, W., 67-M.  
Werth, E., 223-M.

- Westerdyk, Joh.a, 67-M.  
Weston, W. A. R. Dillon, 52-M.  
Weston, Wm. H., Jr., 176-M.  
Whetzel, H. H., 224-M.  
White, Richard, 52-M.  
White, R. P., 216-M.  
Whitehead, T., 67-M, 224-M.  
Wichmand, Hans, 222-M.  
Wiebe, G. A., 46-M.  
Wiesmann, Ron, 224-M.  
Wilcoxon, Franck, 52-M, 224-M.  
Wilcox, L. V., 66-M.  
Wildermuth, V. L., 67-M.  
Willaume, F., 224-M.  
Wille, Johannes, 52-M, 123-M.  
Williams, F. X., 67-M, 123-M.  
Wingard, S. A., 49-M, 62-M.  
Wojtysiak, Antoni, 224-M.  
Wolf, Frederick, 104-M.  
Wollenweber, H. W., 20-M, 121-M,  
200-M.  
Womersley, H., 219-M.  
Woodhams, George E., 68-M.  
Wormald, H., 68-M, 200-M.  
YOTIERS, M. A., 68-M, 137-M.  
ZACCAGNINI, A., 52-M.  
Zacharov, P., 124-M.  
Zacher, F., 140-M.  
Zacher, Friedrich, 140-M.  
Zaleski, Karol, 45-M.  
Zarchin, M. M., 52-M.  
Zaumeyer, W. J., 62-M, 124-M.  
Zeiner, Walter, 140-M.  
Zeman, Victor, 124-M.  
Zillig, H., 121-M.  
Zimmer, R., 46-M.  
Zimmermann, A., 36-M.  
Zorin, P., 124-M.  
Zwölfer, W., 52-M, 68-M.
-



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